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TRACOR 66-296-C

Contract Number N123(953)53354A

TRACOR Project 20017

AD A 039555

FIRST IDA SUBMITTAL FOR TRANSDUCER
ELEMENT DESIGN FOR LOOSELY PACKED PLANAR ARRAY
COMMON PROBLEM 1.1

Submitted to
Conformal/Planar Array Project

May 11, 1966

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9 TECHNICAL MEMORANDUM

6 FIRST IDA SUBMITTAL FOR TRANSDUCER
ELEMENT DESIGN FOR LOOSELY PACKED PLANAR ARRAY
COMMON PROBLEM 1.1

Submitted to
Conformal/Planar Array Project

11 11 May 1966

12384p

Approved:

A. F. Wittenborn

Technical Director

Submitted:

F. John Johnson

Project Engineer

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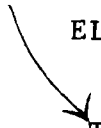
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FIRST IDA SUBMITTAL FOR TRANSDUCER
ELEMENT DESIGN FOR LOOSELY PACKED PLANAR ARRAY
COMMON PROBLEM 1.1



TRACOR has been assigned the task of performing computer evaluations of transducer element design submittals for the C/P Array Program as directed by the NEL Transducer Division. This report contains the results of the first iteration of the Iterative Design Activity (~~IDA~~) teams from the various participating vendors. Certain properties for each of the transducer element designs are presented in graphical form using identical format and scaling for ease of comparison and evaluation of the various designs.

The element design under consideration for this report is a loosely packed array of 13 rows and 229 columns of 5 inch circular elements with 8 inch center to center spacing. (Common Problem 1). Four element designs are presented: GE, TRG, NEL, and GD/E (C.P.1.1). The element chosen for the final design of the first iteration was that proposed by GD/E. The results for this element are labeled C.P.1.1 to indicate Common Problem 1, iteration 1.

Each element is examined for various properties over three frequency bands for three different steerings. At each steering, parametric curves for various element properties representing the "worst case" radiation loadings in the array are presented. These loadings were obtained from computations performed by TRG, Inc. on C.P.1 arrays and the cases chosen for this evaluation are given in Tables 1, 2, and 3 for the various frequencies. These results assume velocity control and are evaluated at one frequency in each band. However, since it can be shown that the loadings are not a "strong" function of frequency, this approximation of constant loading across the frequency band will not invalidate the design evaluations.

Under the assumption that cavitation occurs whenever the surface pressure on an element exceeds 1.5 atmospheres, a driving current (cavitation limited) is determined such that cavitation occurs on that element in the array with maximum surface pressure. For each steering, the properties presented in the graphs are computed with the element under consideration being driven with the cavitation limited current.

The presentation of the designs considered is organized in the following manner.

- I. Designer (GE, GD/E, TRG, or NEL)
 - A. Frequency Band (Low, Mid, High)
 1. Property ($|I|$, $|E|$, $|Z_{in}|$, etc.)
 - a. Steering (Endfire, 30° , broadside)

Prefacing each element design are sample "rough" diagrams of the element configuration, the equivalent four terminal networks used in the computer element model, and a schematic diagram of the electrical "tuning" circuits for each band with the values of the components given.

Several element properties were used in the design of the element. The following properties, which are presented graphically as a function of frequency, were considered in the choice of the final design of this iteration.

- 1) $|\frac{V_H}{I}|$ Magnitude of head velocity normalized to input current
- 2) $\text{ARG} (\frac{V_H}{I})$ Phase of head velocity normalized to input current
- 3) $|\vec{e}|$ Magnitude of electric field (voltage on each ring/thickness of ring in mils.)
- 4) $|Z_{in}|$ Magnitude of input impedance

- 5) $\text{ARG}(Z_{in})$ Phase of input impedance
- 6) $|E_{in} * I_{in}|$ Magnitude of volt-amp product of input voltage and input current
- 7) $P_C - P_H$ Loss in the ceramic; i.e., power into ceramic minus power out at the head
- 8) $\frac{P_H}{P_{in}}$ Total efficiency; i.e., power out at head/ power into inductor circuit
- 9) $|Z_{IOC}|$ Magnitude of the ratio of composite element parameters relating current to head velocity (for current control this is the same as the magnitude of the internal impedance of the element)
- 10) Z_{EOC} Magnitude of the ratio of composite element parameters relating voltage to head velocity
- 11) $|I|$ Magnitude of the current

Since this design is to be manufactured and DUMILOAD tested, the graphs contain the title "DUMILOAD I." This element is the first design which will be built and tested on a DUMILOAD facility and should not be confused with the DUMI-ELEMENT which is an integral part of the DUMILOAD facility.

WORST CASE RADIATION LOADINGS

LOW BAND

Page 2: F = 2000 cps.

Theta = 0° Phi = 0°

Velocity of cavitation = .25633071E-01 meters per second
pca = 1.9001530E04

Loadings:

Max. Pressure = 3.08590054E04 + j6.84589403E04
Min. Resistance = 3.06295372E03 + j6.15220308E03
Min. Reactance = 3.57300970E03 + j5.19126037E03
AVG. = 2.44205725E04 + j4.33216357E04

Page 4: F = 2000 cps.

Theta = 0° Phi = 30°

Velocity of cavitation = .10791793E-00 meters per second

Loadings:

Max. Pressure = 1.70359401E04 + j5.28297277E03
Max. Resistance = 1.72759279E04 + j3.19188898E03
Min. Resistance = 3.18166958E03 + j6.18375532E03
Max. Reactance = 1.14610751E04 + j1.00632375E04
Min. Reactance = 8.09602996E03 - j1.58026357E03
AVG. = 1.14146599E04 + j3.81251049E03

Page 8: F = 2000 cps.

Theta = 0° Phi = 90°

Velocity of cavitation = .20641517 meters per second

Loadings:

Max. Pressure = 8.62318751E03 + j3.54954775E03
Min. Resistance = 4.04152567E03 + j1.58332185E03
Max. Reactance = 4.71313038E03 + j6.22775241E03
Min. Reactance = 5.48191309E03 - j1.07796008E02
AVG. = 5.92082810E03 + j3.08428731E03

Compiled From TRG's Results
For C.P.1 Array, Problem 137

Table 1

WORST CASE RADIATION LOADINGS

MID BAND

Page 24: F = 2500 cps.

Theta = 0° Phi = 0°

Velocity of cavitation = .022599425 meters per second

Loadings:

Max. Pressure	=	3.70694046E04	+	j7.66828215E04
Min. Resistance	=	3.48842781E03	+	j7.81806304E03
Max. Reactance	=	3.43145191E04	+	j7.70014372E04
Min. Reactance	=	3.80512498E03	+	j6.91990765E03
AVG.	=	2.81596841E04	+	j4.83015054E04

Page 26: F = 2500 cps.

Theta = 0° Phi = 30°

Velocity of cavitation = .11002911 meters per second

Loadings:

Max. Pressure	=	1.61847804E04	+	j6.64038697E03
Min. Resistance	=	3.66139341E03	+	j7.66241486E03
Max. Reactance	=	1.07609438E04	+	j1.06836049E04
Min. Reactance	=	1.28174594E04	+	j9.95386351E02
AVG.	=	1.09357651E04	+	j4.93621119E03

Page 30: F = 2500 cps.

Theta = 0° Phi = 90°

Velocity of cavitation = .20803104 meters per second

Loadings:

Max. Pressure	=	5.50801644E03	+	j7.43469919E03
Max. Resistance	=	8.18015867E03	+	j1.90754574E03
Min. Resistance	=	4.27851865E03	+	j2.38239074E03
Min. Reactance	=	5.94411695E03	+	j1.82753326E03
AVG.	=	6.13526911E03	+	j3.81425445E03

Compiled From TRG's Results

For C.P.1 Array, Problem 137

Table 2

WORST CASE RADIATION LOADINGS

HIGH BAND

Page 46: F = 3000 cps.

Theta = 0° Phi = 0°

Velocity of cavitation = .020291127 meters per second

Loadings:

Max. Pressure = 4.03970761E04 + j8.58303975E04
Min. Resistance = 3.50168917E03 + j9.28735198E03
AVG. = 3.05065992E04 + j5.25781665E04

Page 48: F = 3000 cps.

Theta = 0° Phi = 30°

Velocity of cavitation = .10456341 meters per second

Loadings:

Max. Pressure = 1.65302281E04 + j8.10088048E03
Min. Resistance = 3.53874880E03 + j9.01288799E03
Max. Reactance = 8.04770071E03 + j1.20617606E04
Min. Reactance = 9.73845096E03 + j1.52307533E03
AVG. = 9.89594457E03 + j6.38905526E03

Page 52: F = 3000 cps.

Theta = 0° Phi = 90°

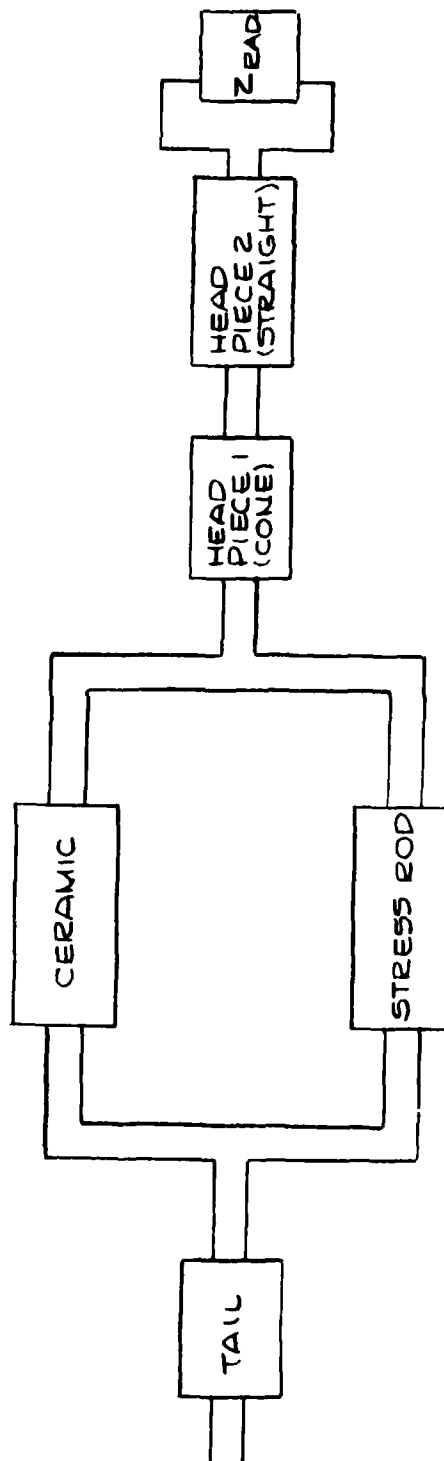
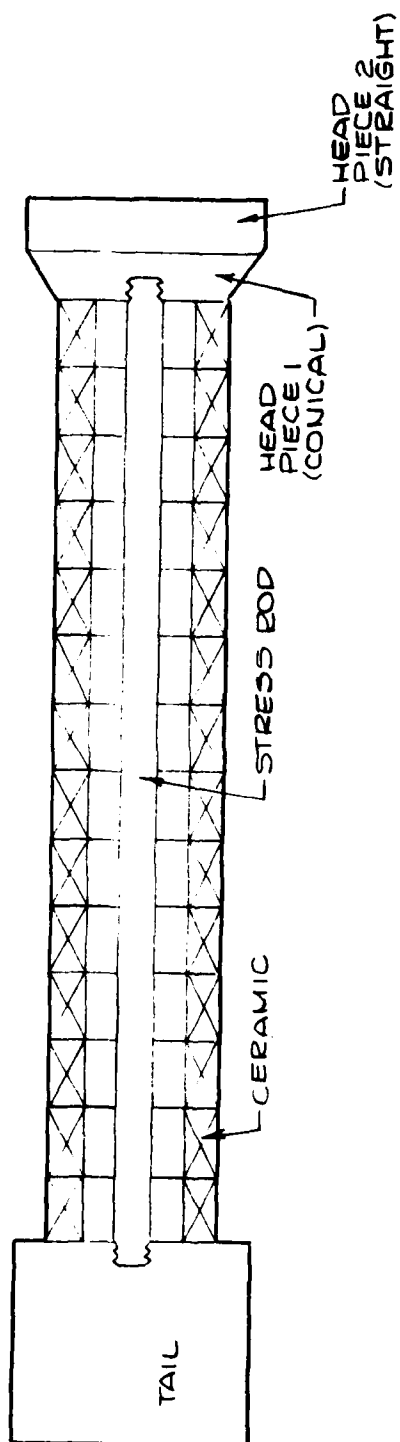
Velocity of cavitation = .19248667

Loadings:

Max. Pressure = 5.83226748E03 + j8.12301916E03
Max. Resistance = 7.04807449E03 + j2.79985796E03
Min. Resistance = 3.78636591E03 + j3.64525485E03
Min. Reactance = 6.77634102E03 + j1.41083003E03
AVG. = 5.07857123E03 + j4.58678978E03

Compiled From TRG's Results
For C.P.1 Array, Problem 137
Table 3

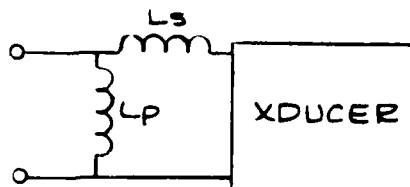
NET



NEL DUMILOAD I

NEL
DUMILOAD I C.R 1
3 INCH CIRCULAR HEAD

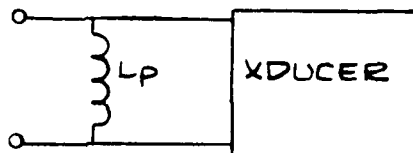
LOW BAND



$$L_s = 0.158962 \quad Q_s = 10^{50}$$

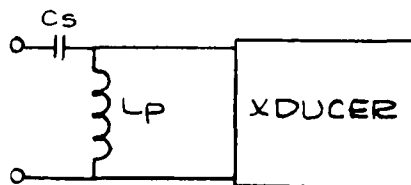
$$L_p = 0.300463 \quad Q_p = 10^{50}$$

MID BAND



$$L_p = 0.3903776857 \quad Q_p = 10^{50}$$

HIGH BAND



$$L_p = 0.27378 \quad Q_p = 10^{50}$$

$$C_s = 0.293283 \times 10^{-7} \quad D_s = 0.0$$

DATE 4/15/67

RUN NUMBER 2-03-0018-W

NON-PIEZOELECTRIC MATERIAL PARAMETERS ACTIVE TRANSDUCER VOLTAGE CONTROL

SECTION NAME	PIECE NO.	PIECE TYPE	DENSITY	LENGTH	LEFT AREA	RIGHT AREA	LONGITUDINAL VEL. OF SOUND
TAIL	1	0	7.839000E-03	6.330025E-02	1.266768E-02	1.266766E-02	5.116000E-03
STRESS ROD	1	0	7.741000E-03	2.667000E-01	1.266000E-04	1.266000E-04	4.970000E-03
HEAD	1	1	7.839000E-03	2.406735E-02	4.560366E-03	1.266770E-02	5.116000E-03
	2	0	7.839000E-03	1.270000E-02	1.266770E-02	1.266770E-02	5.116000E-03

INPUT PARAMETERS FOR TRANSDUCER ANALYSIS ACTIVE CERAMIC PARAMETERS

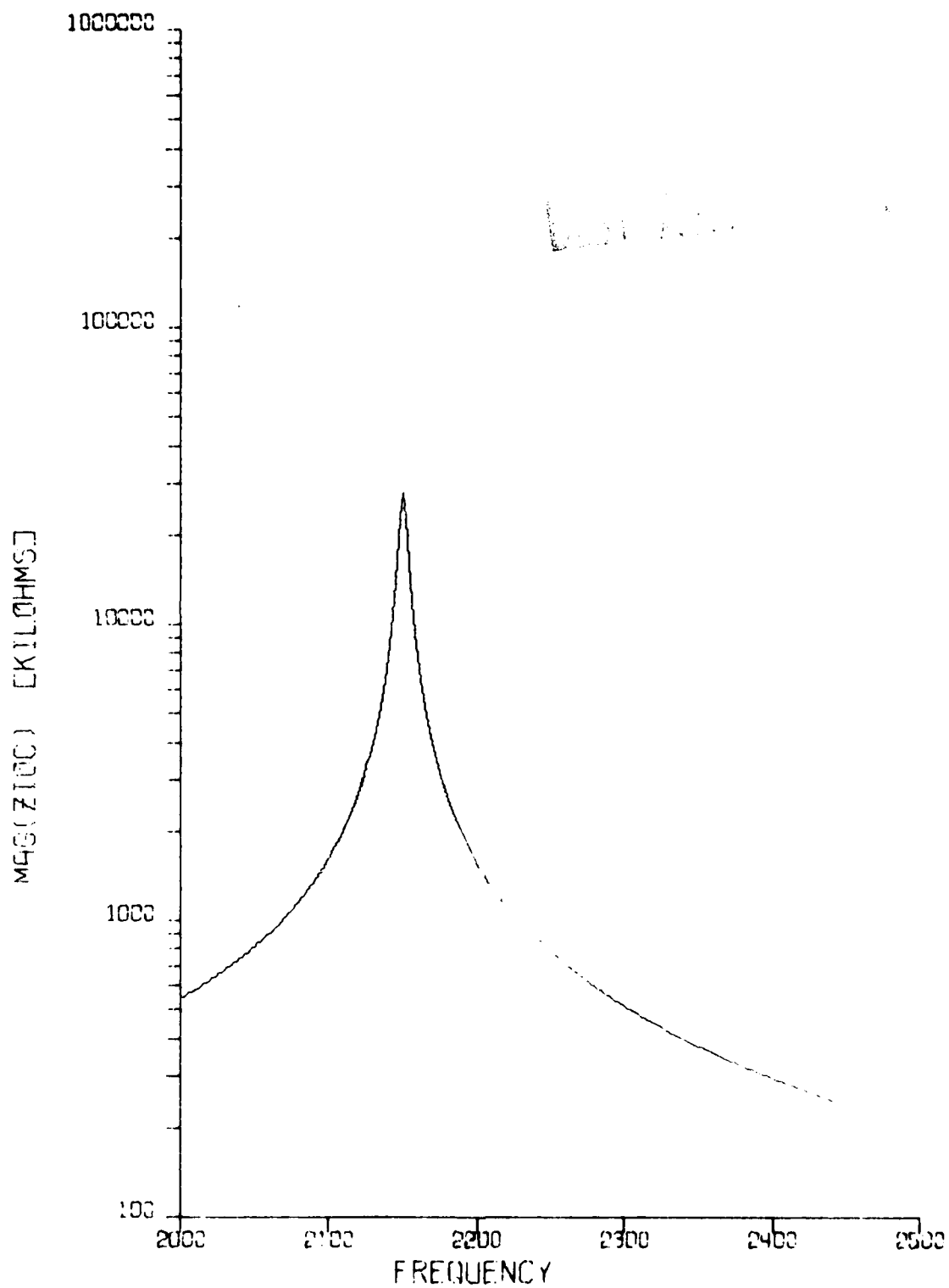
REAL	IMAGINARY	REAL	IMAGINARY	REAL	IMAGINARY
1.020550E-11	-2.430957E-14	2.279840E-02	1.744306E-03	1.280360E-03	-2.929464E-00
NO. OF RINGS	DENSITY	AREA	LENGTH		
14	7.440000E-03	2.533540E-03	1.905000E-02		

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LOW BAND

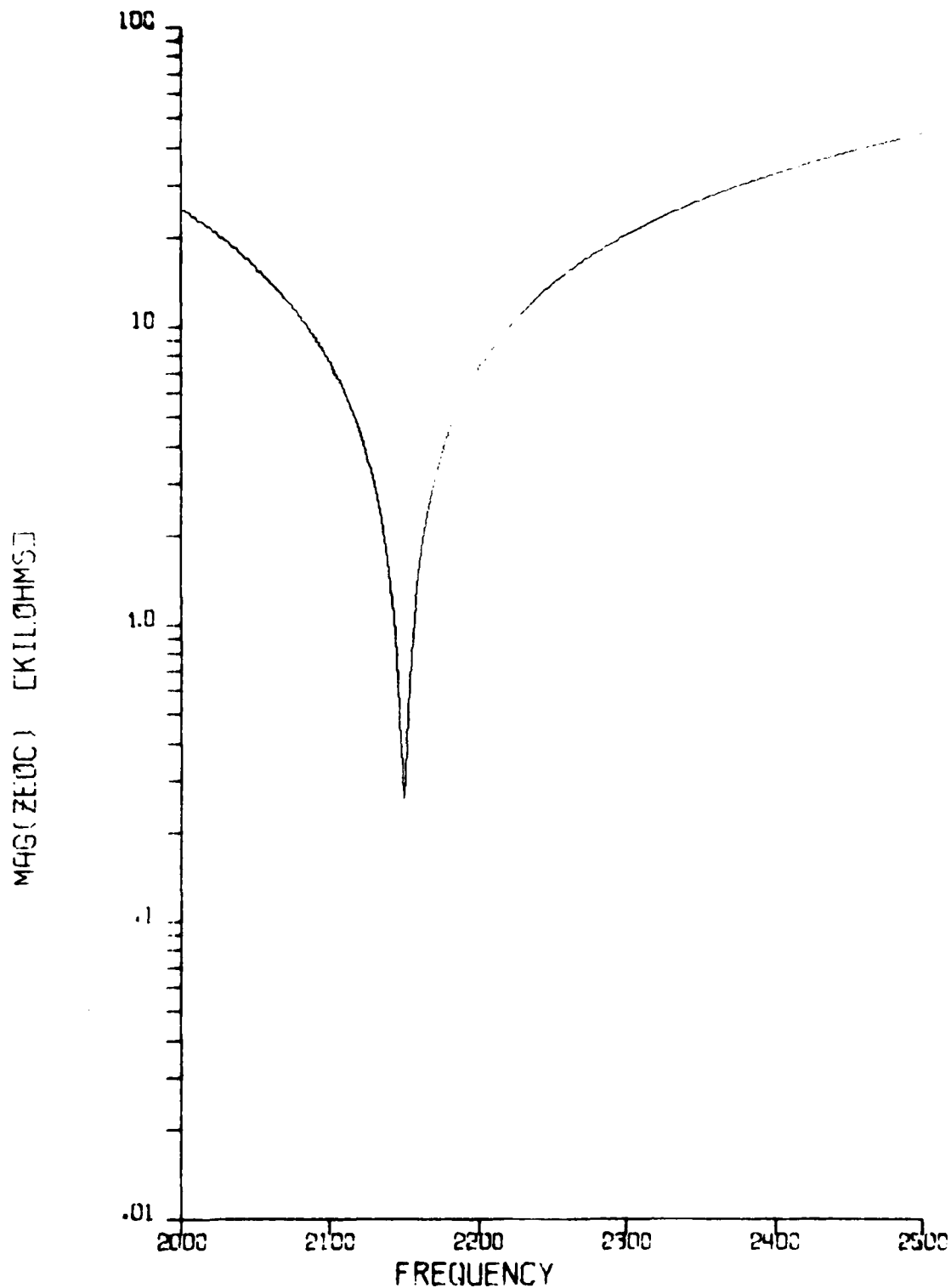
REL. DOWNLOAD 1
C.P. 1 5 INCH CIRCULAR HEAD
LOW BAND
LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(Z100) VERSUS FREQUENCY

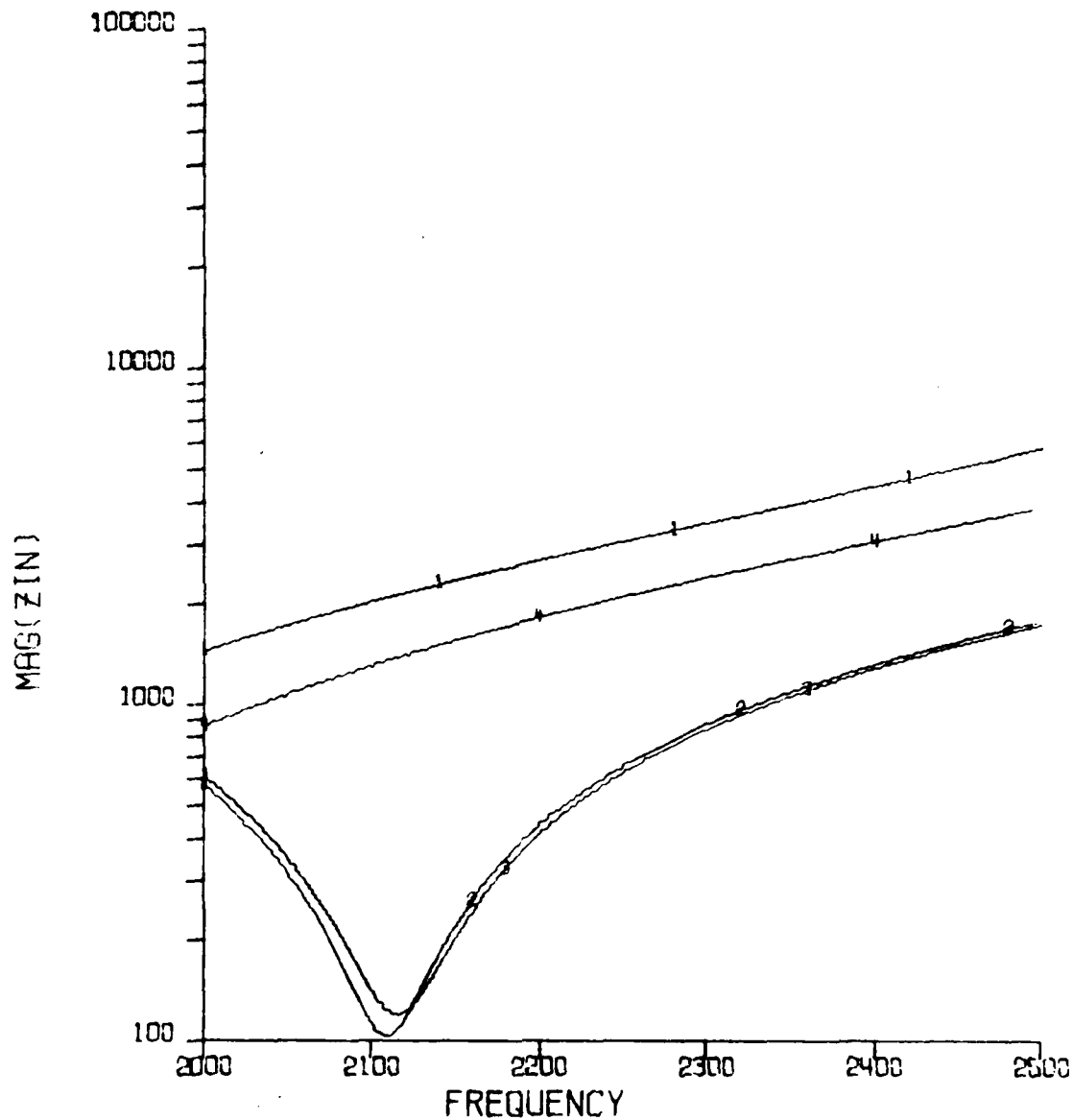
C.P. 1 5 INCH CIRCULAR HEAD
LOW BAND

LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(ZE0C) VERSUS FREQUENCY

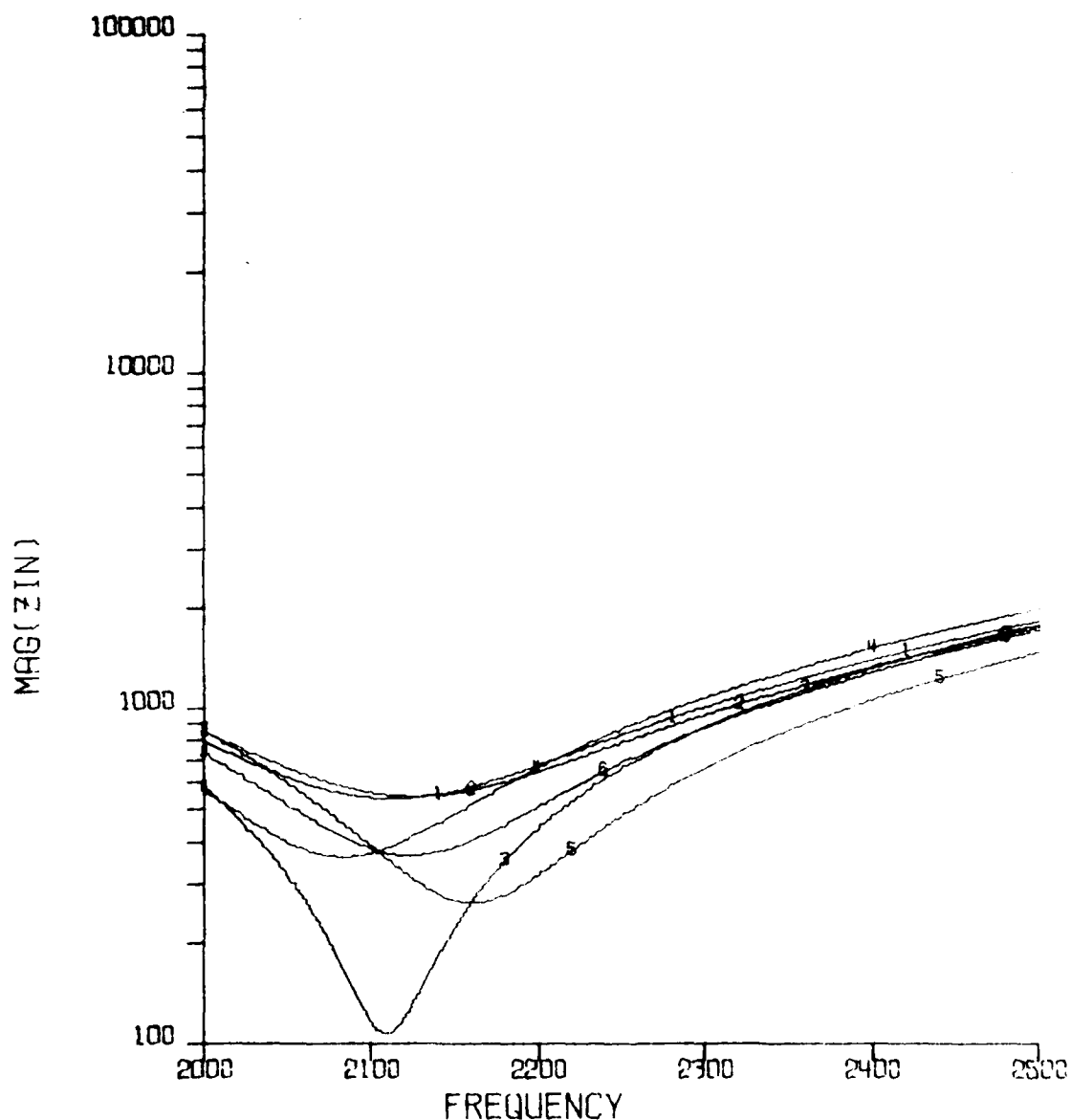
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

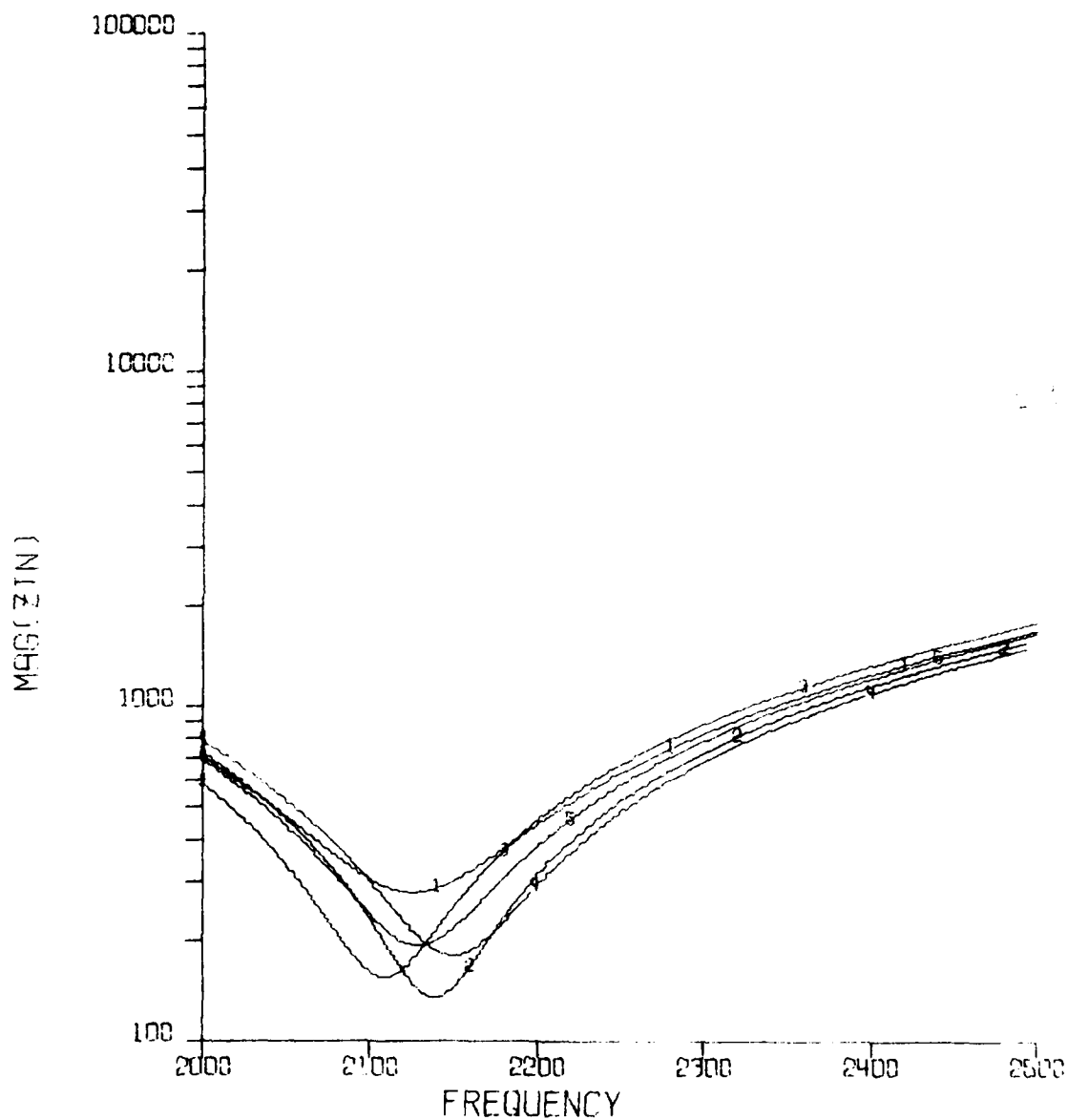
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 Q9=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

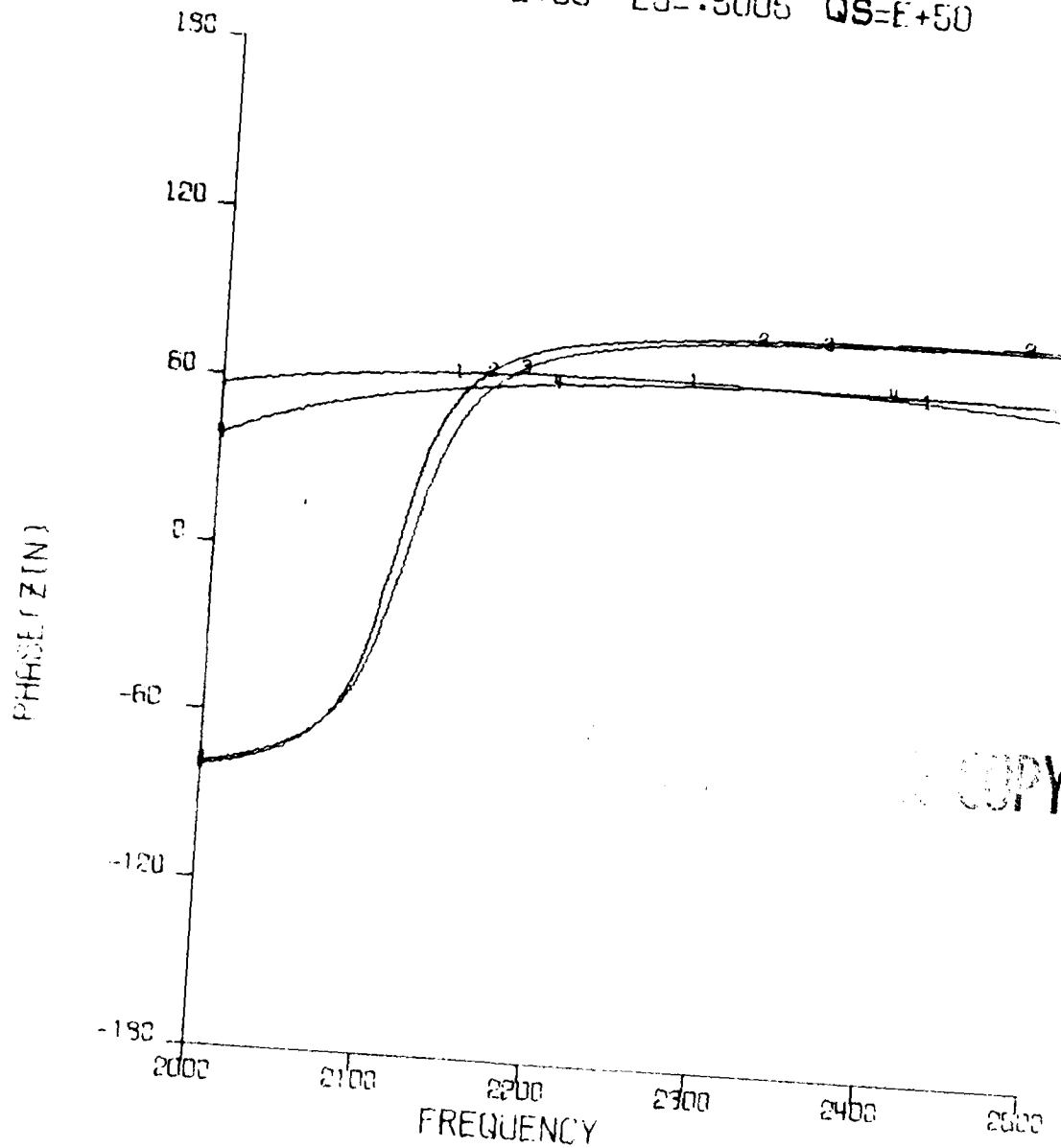
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(ZIN) VERSUS FREQUENCY

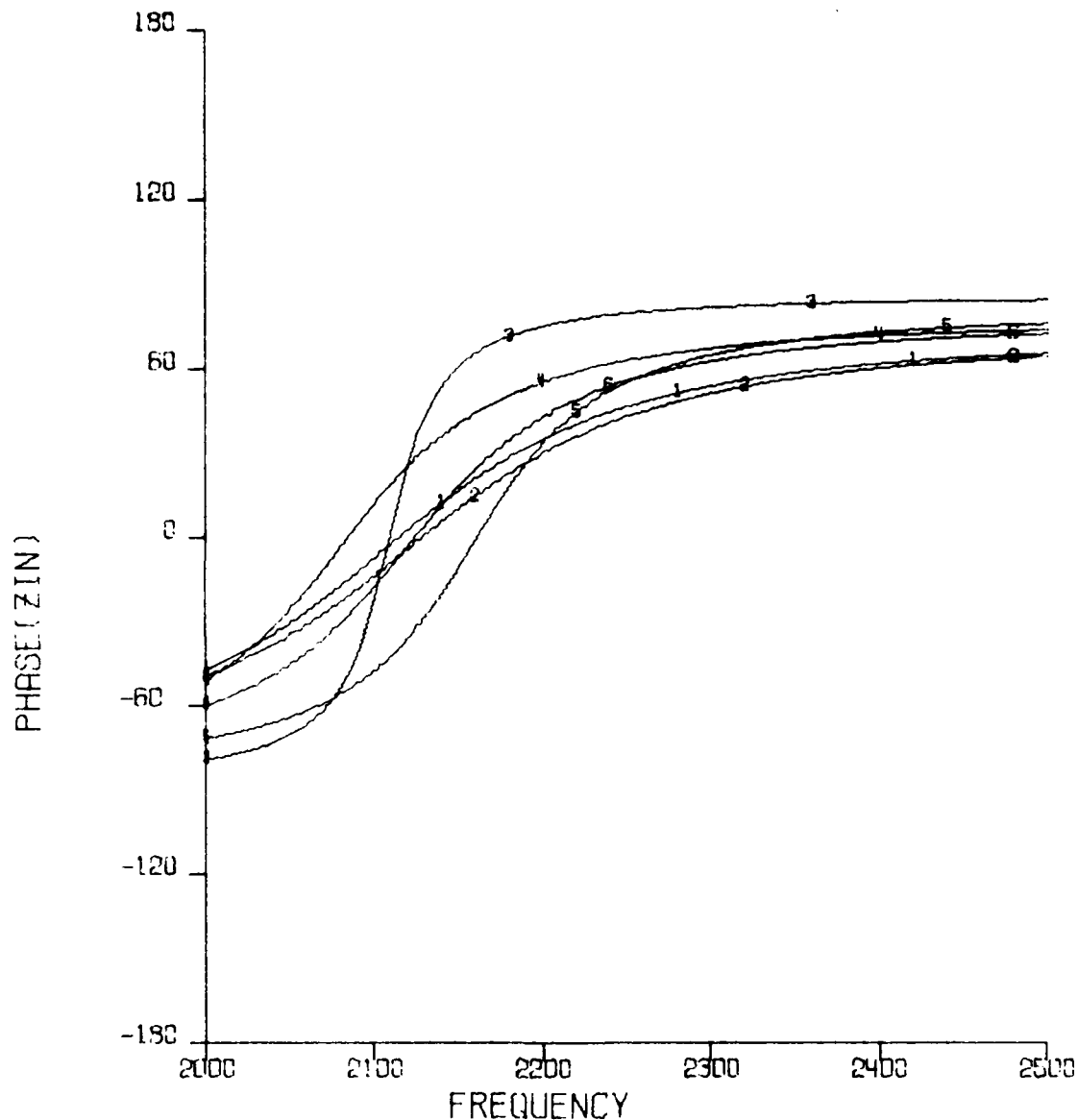
CURVE 1 - MAX PRES= $8.62318751E03 + J3.54954775E05$
 CURVE 2 - MIN R = $4.04152567E03 + J1.58332185E05$
 CURVE 3 - MAX X = $4.71313038E03 + J6.22775241E03$
 CURVE 4 - MIN X = $5.48191309E03 - J1.07796008E02$
 CURVE 5 - AVG = $5.92082810E03 + J3.08428731E03$

NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



PHASE (ZIN) VERSUS FREQUENCY
 CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

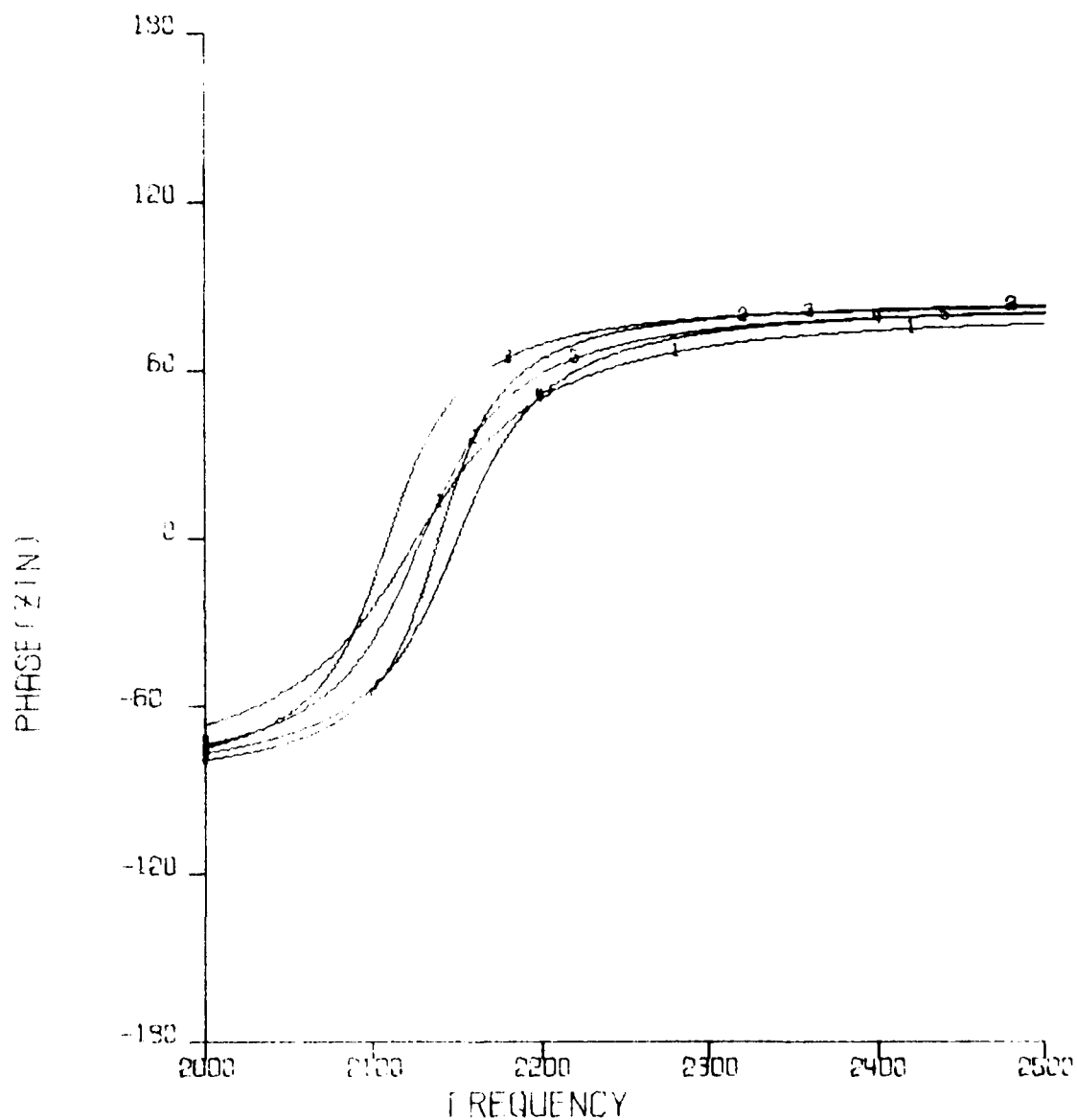
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QB=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
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 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

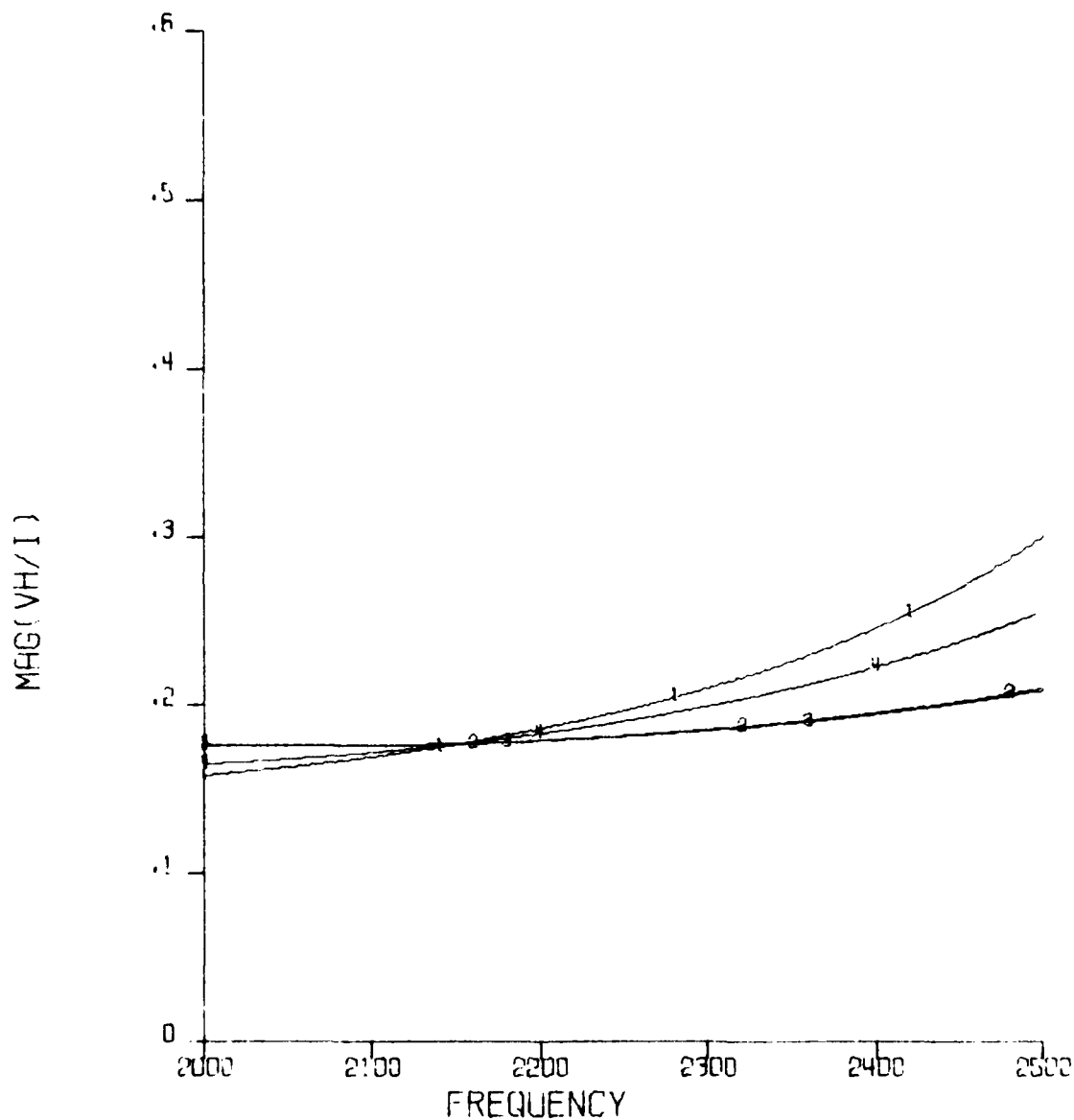
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
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 CURVE 5 - AVG =5.32082810E03+J3.08428731E03

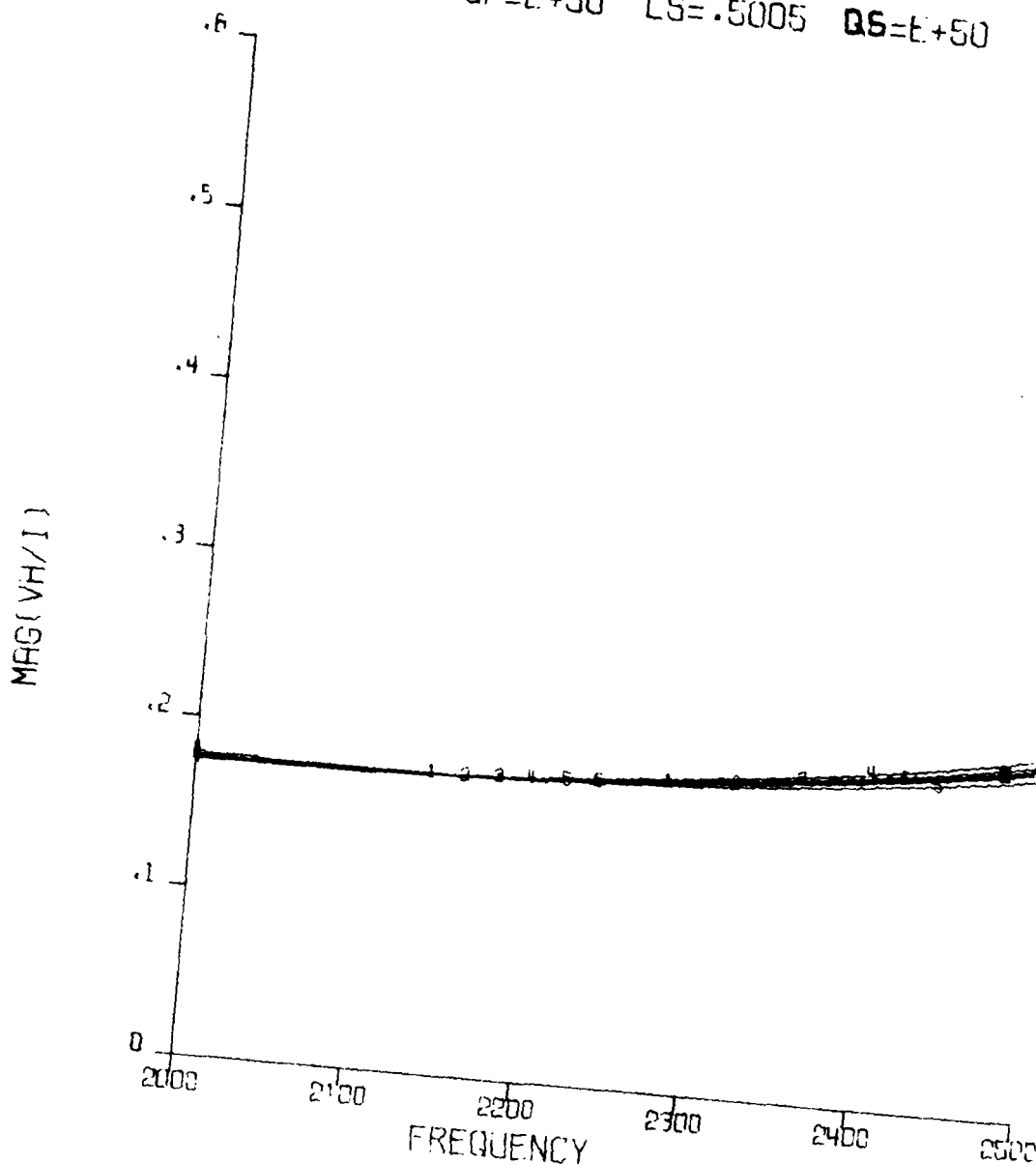
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(VH/I) VERSUS FREQUENCY

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 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

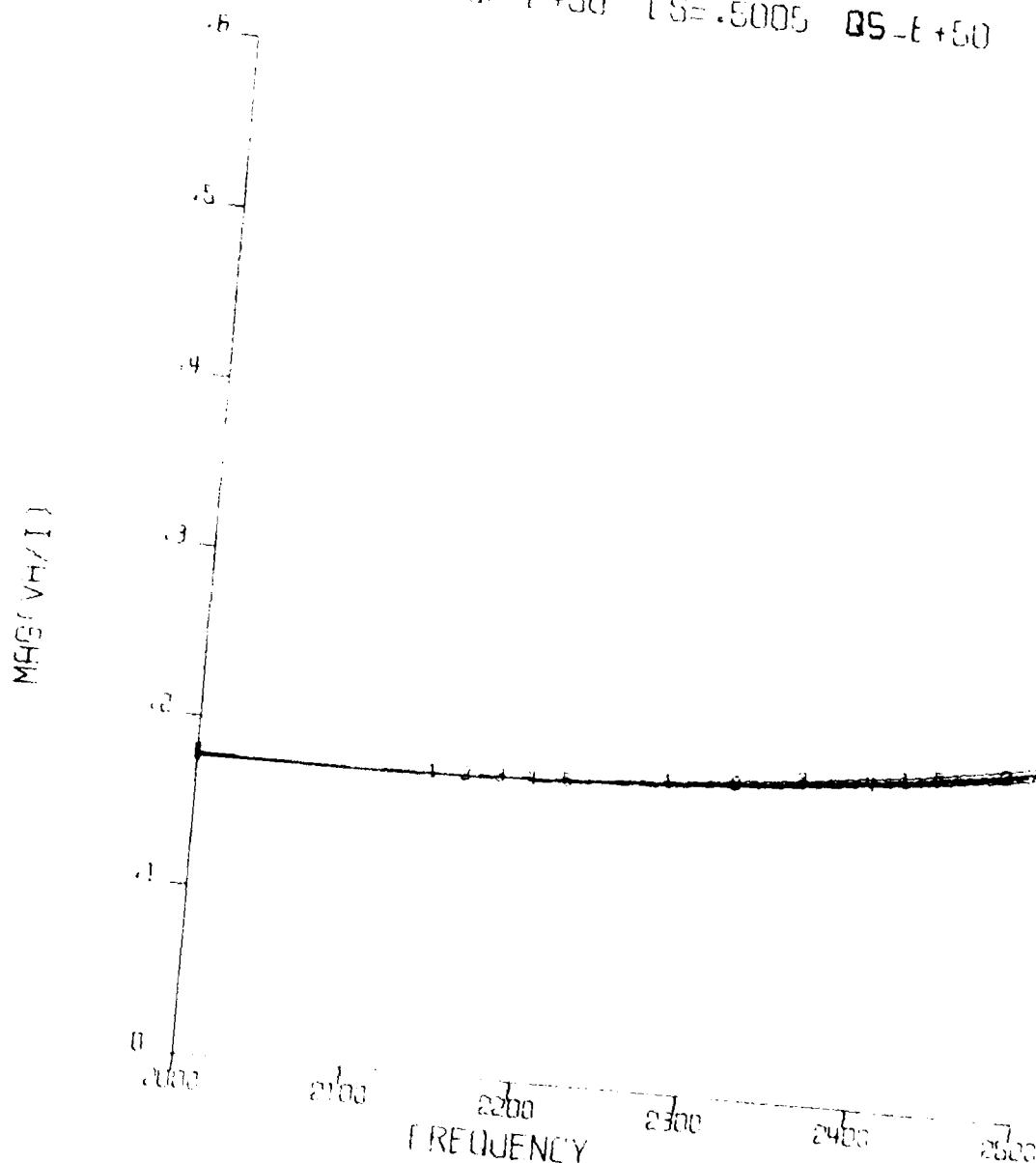
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(VH/I) VERSUS FREQUENCY

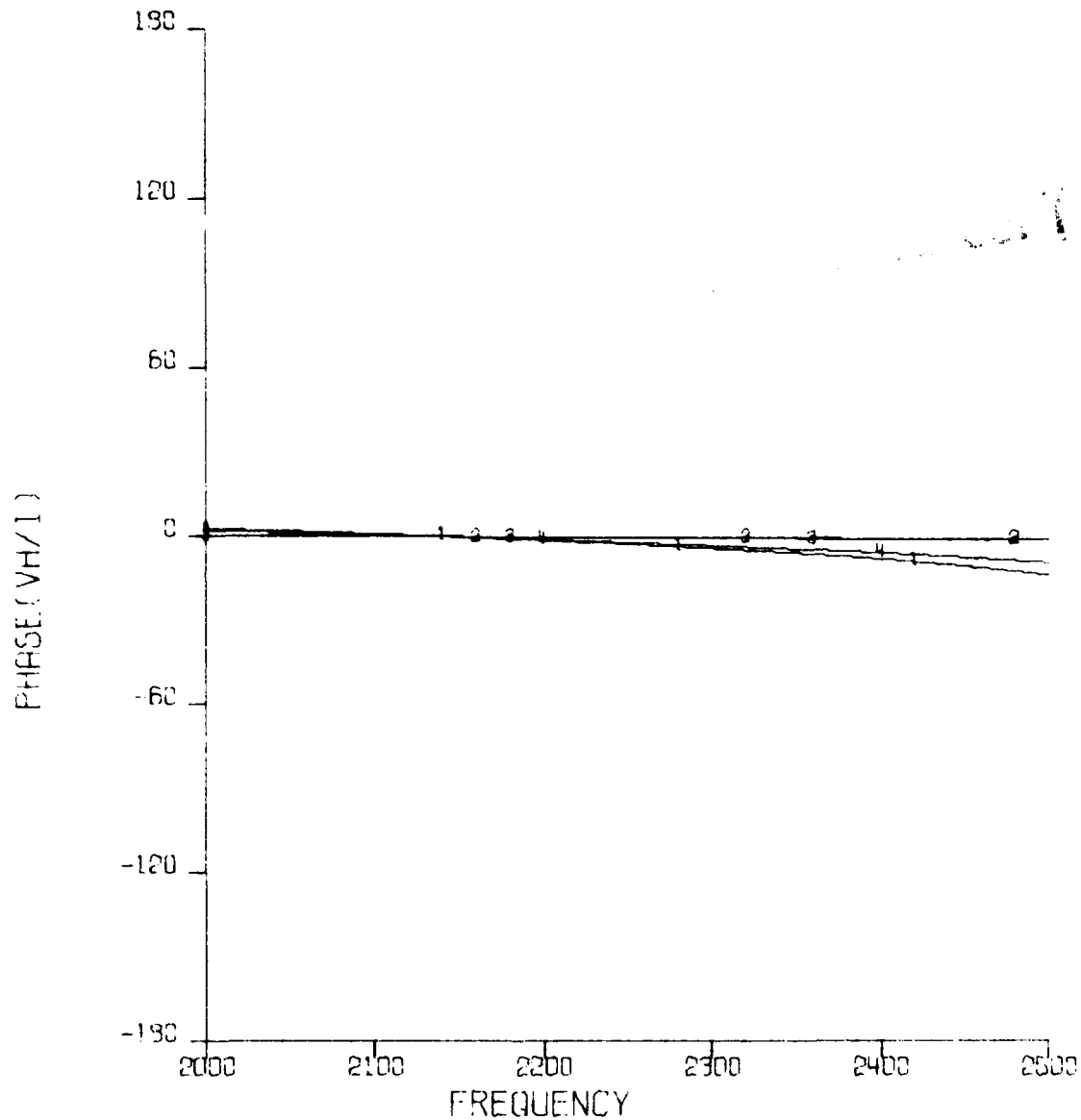
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 CURVE 5 - MIN X =8.09602896E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

NEL DUMIL 3AD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 OP F+50 LS=.5005 BS-F+50



MAG (VH/I) VERSUS FREQUENCY
 CURVE 1 MAX PRES -8.62318751E03+J3.54954775E03
 CURVE 2 MIN R -4.04152567E03+J1.58332185E03
 CURVE 3 MAX X -4.71313038E03+J6.22775241E03
 CURVE 4 MIN X -5.48191309E03-J1.07796008E02
 CURVE 5 AVG -5.32082810E03+J3.08428731E03

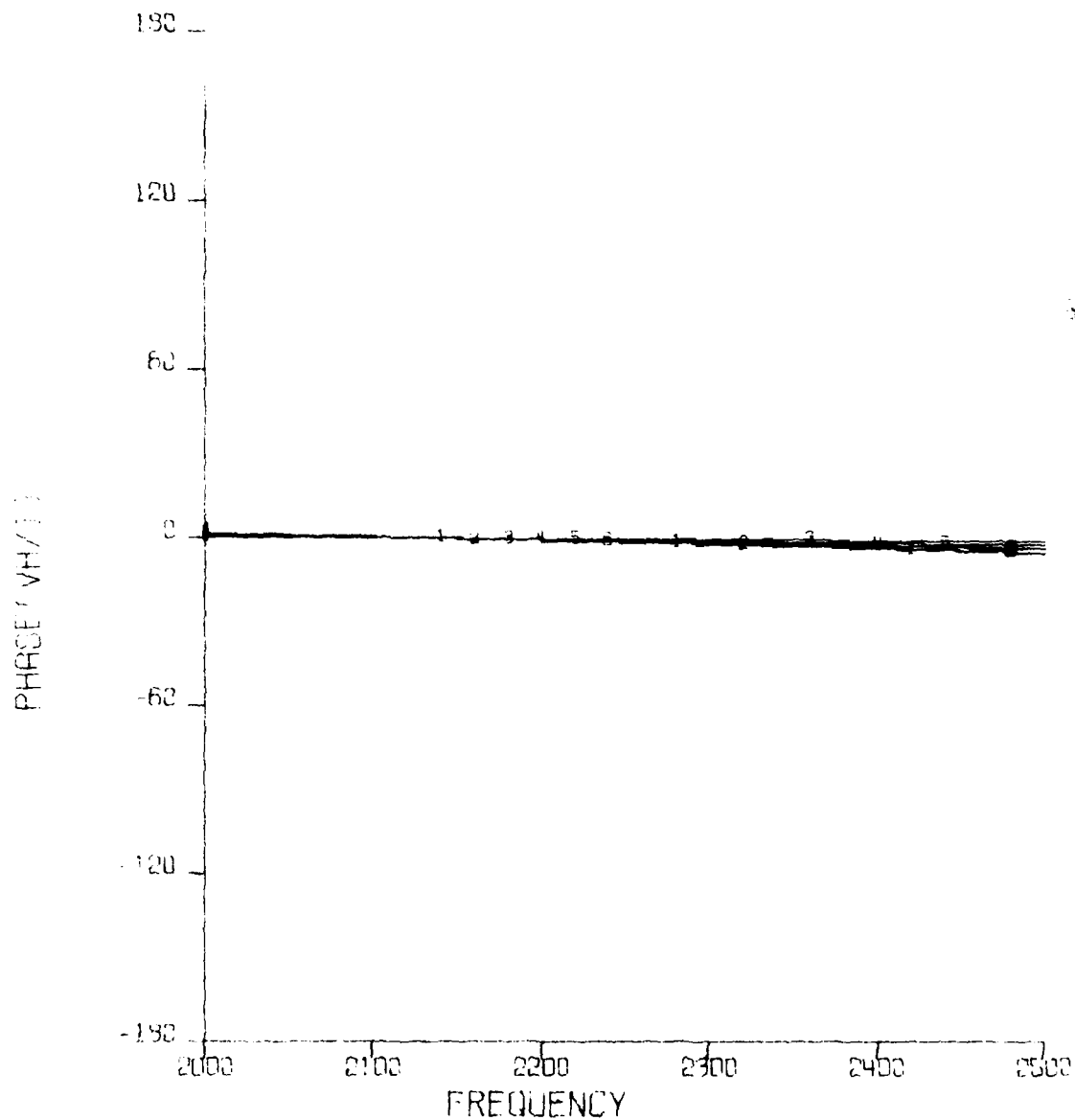
NEL DUMLOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



PHASE (VH/I) VERSUS FREQUENCY

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 CURVE 4 - AVG =2.44205726E04+J4.33216357E04

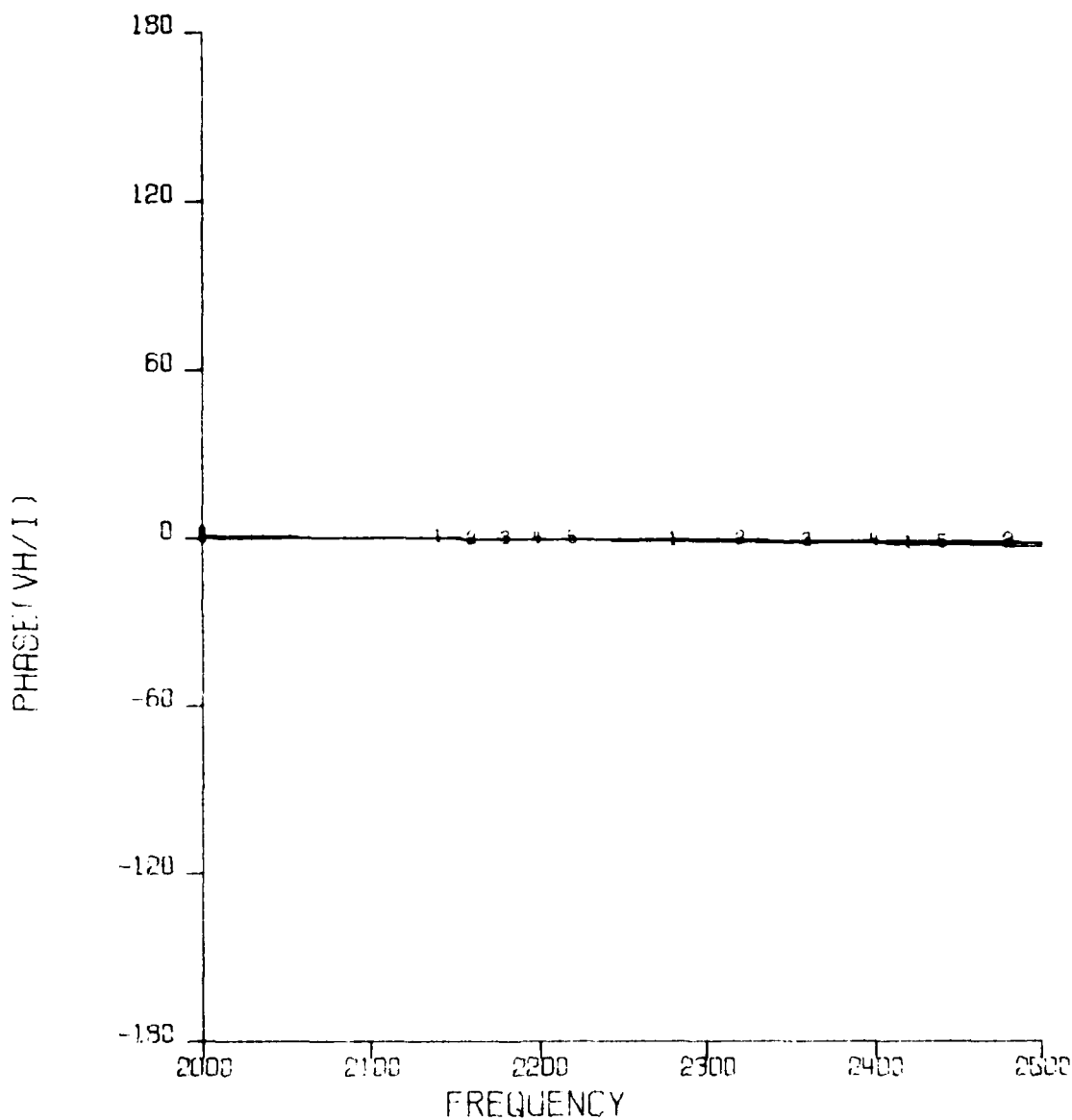
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



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 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

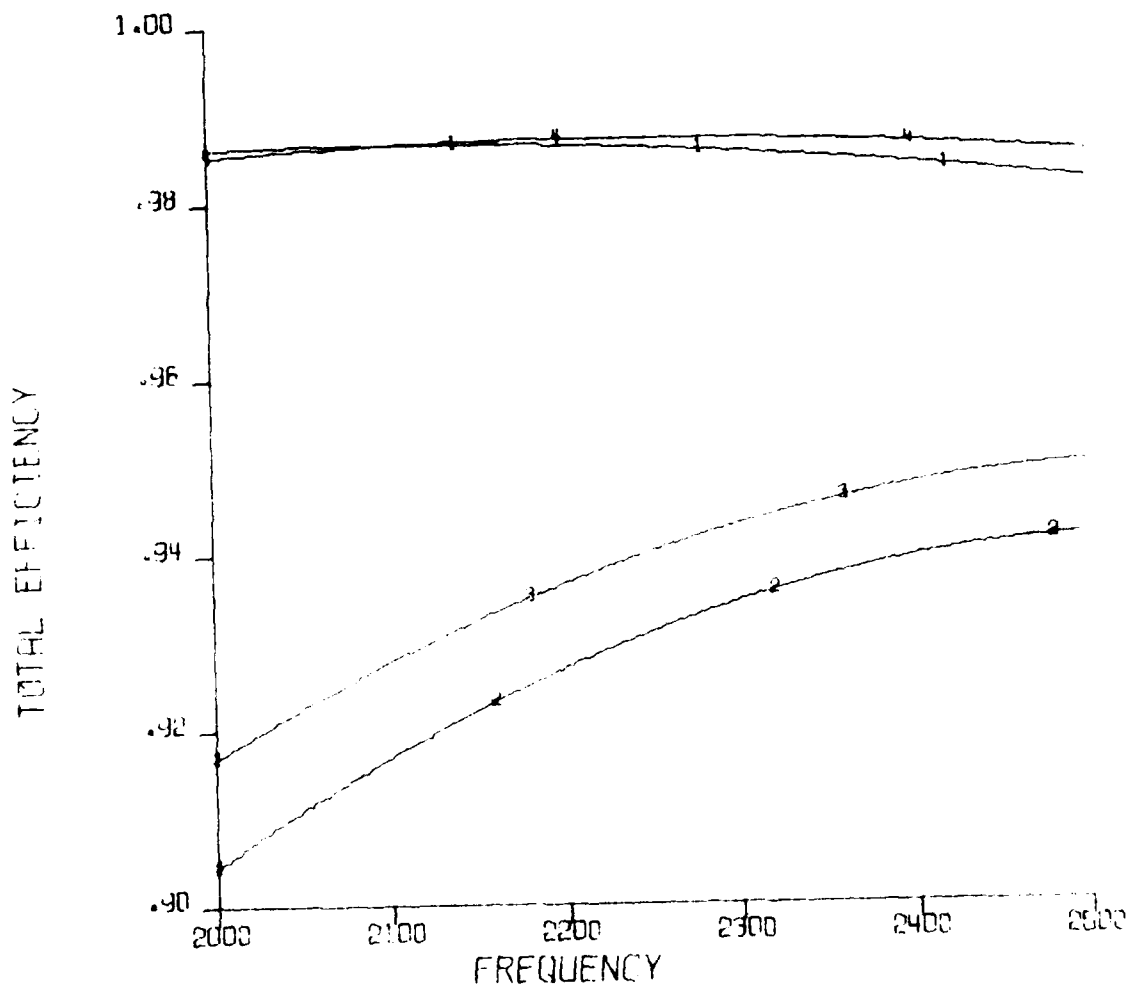
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

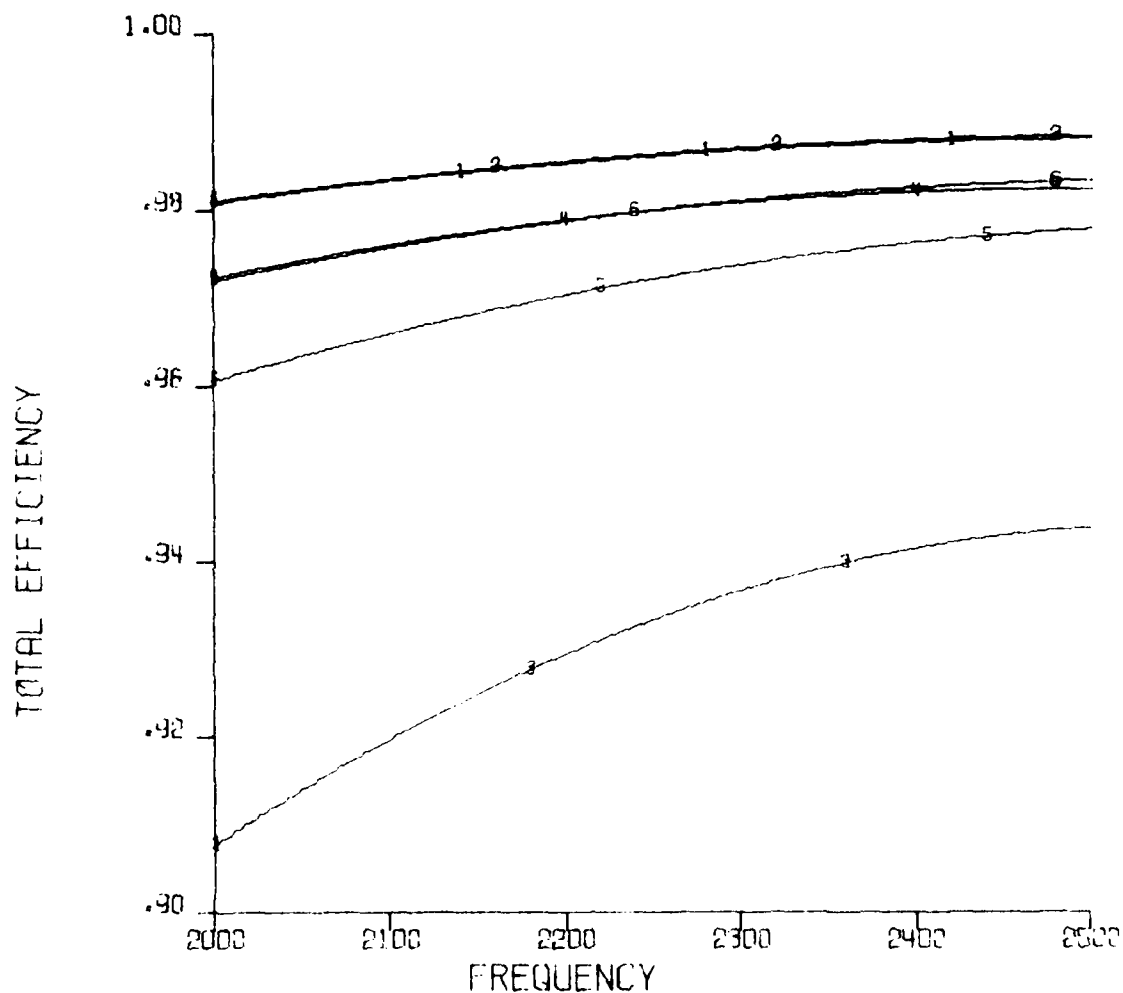
NEL. DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

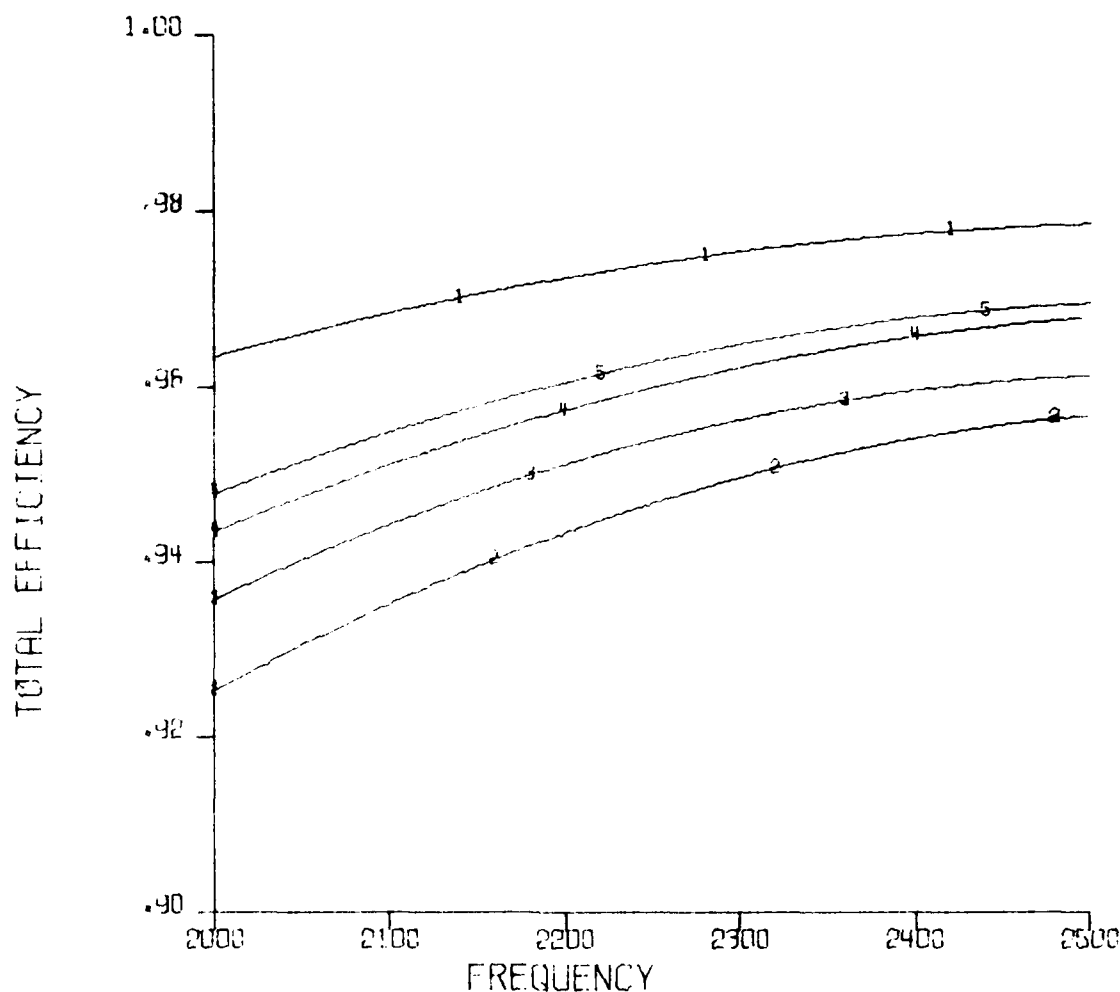
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

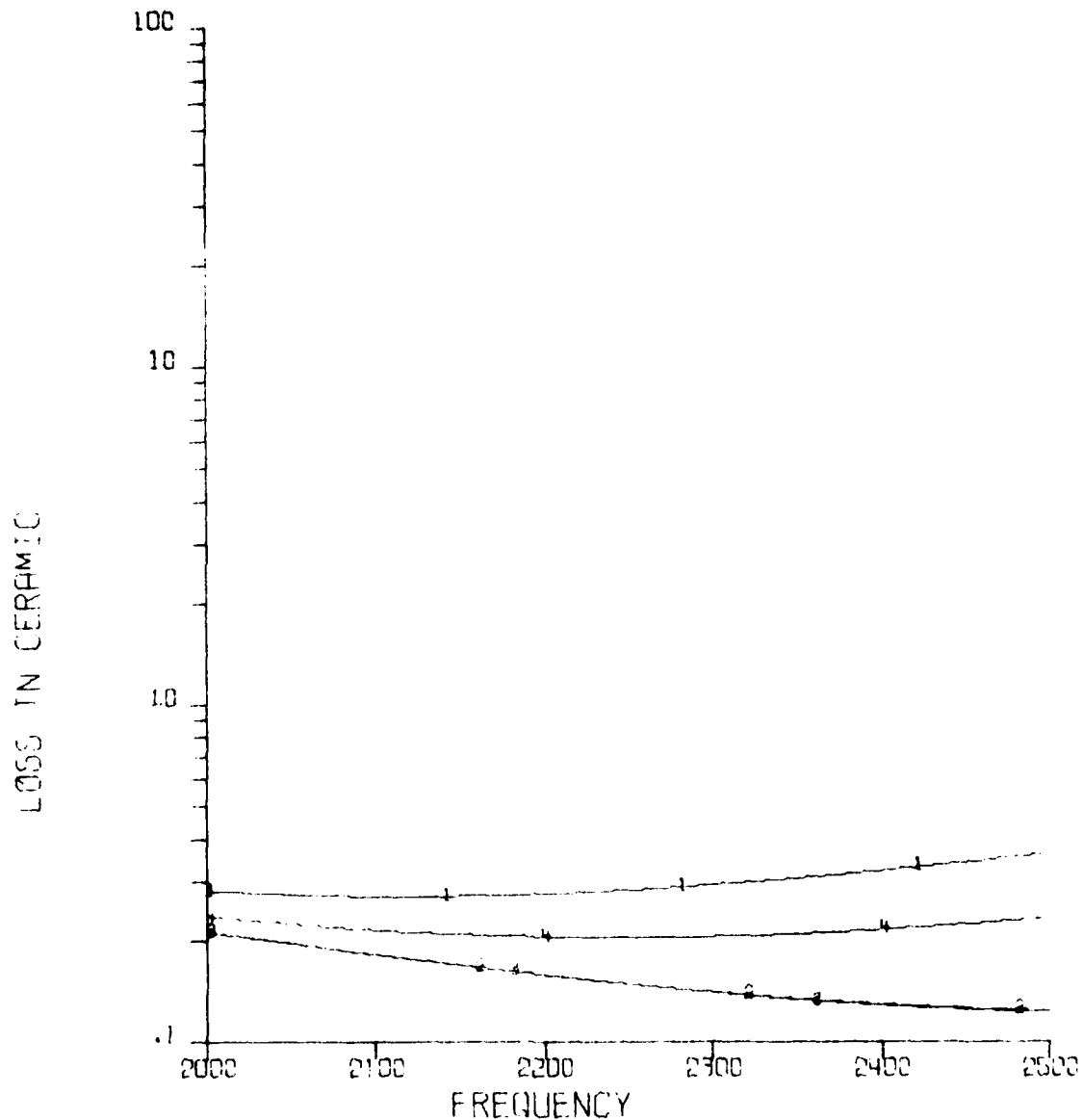
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

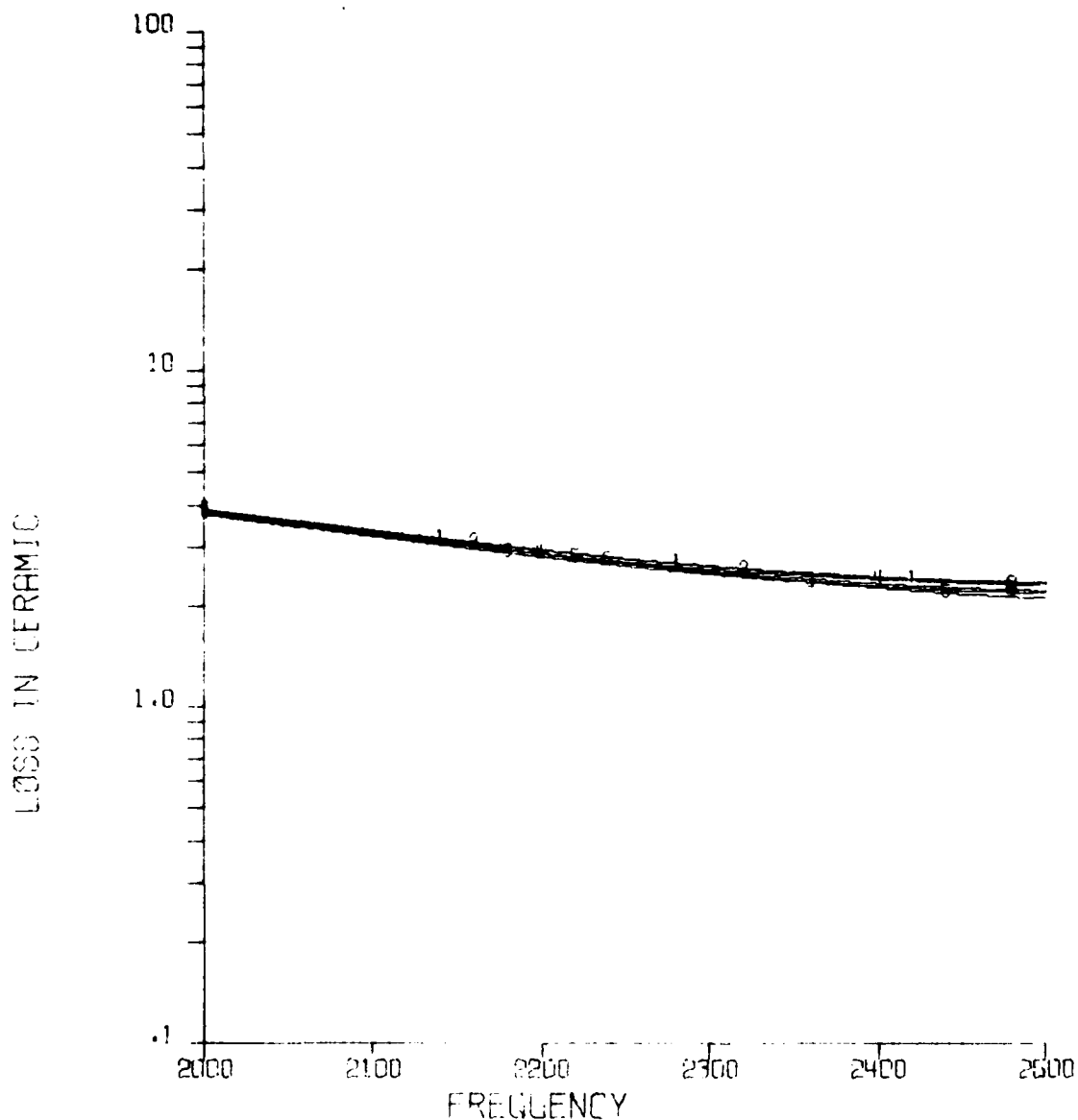
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

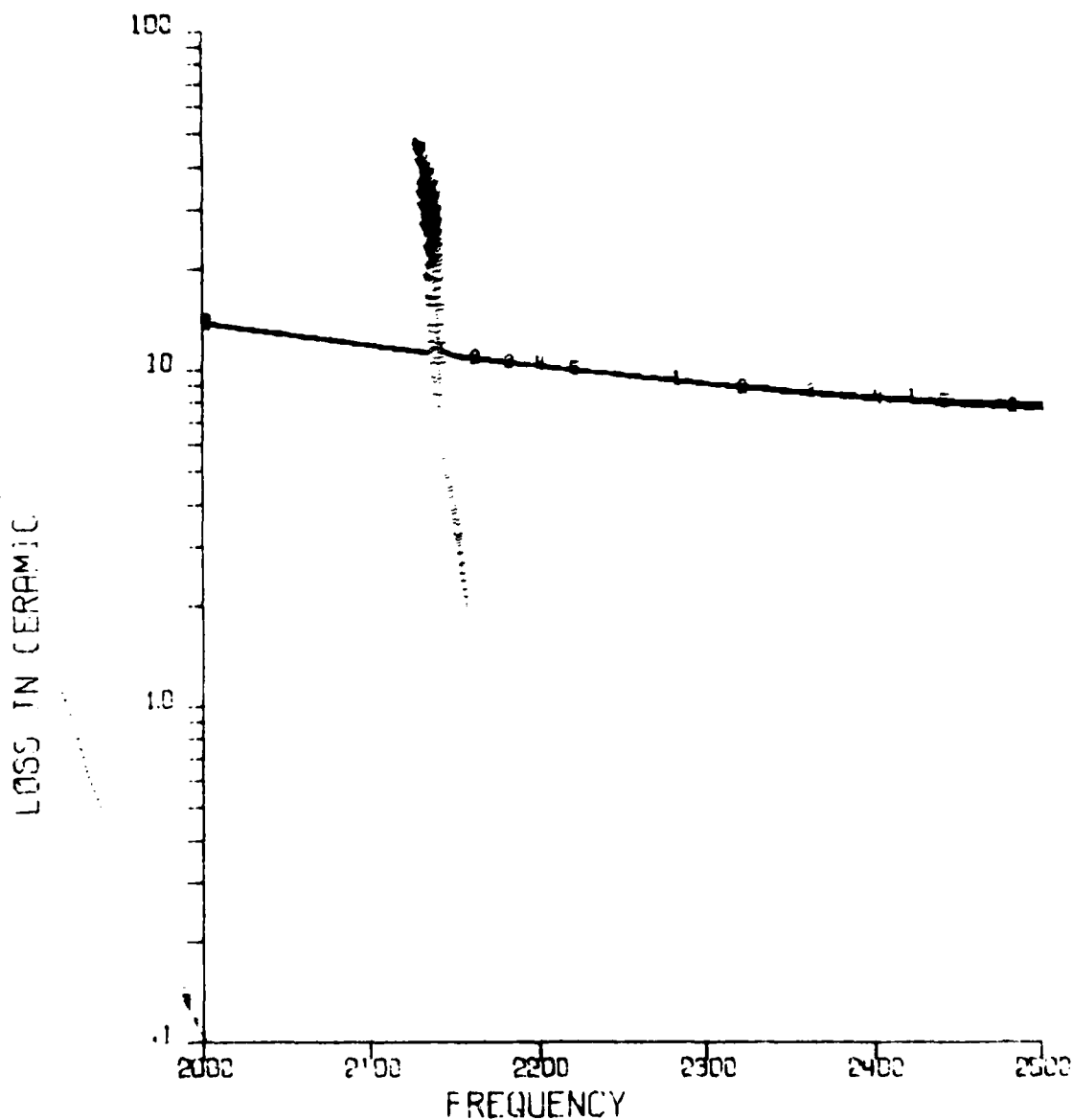
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03 -J1.58026357E03
 CURVE 6 AVG =1.14146599E04+J3.81251049E03

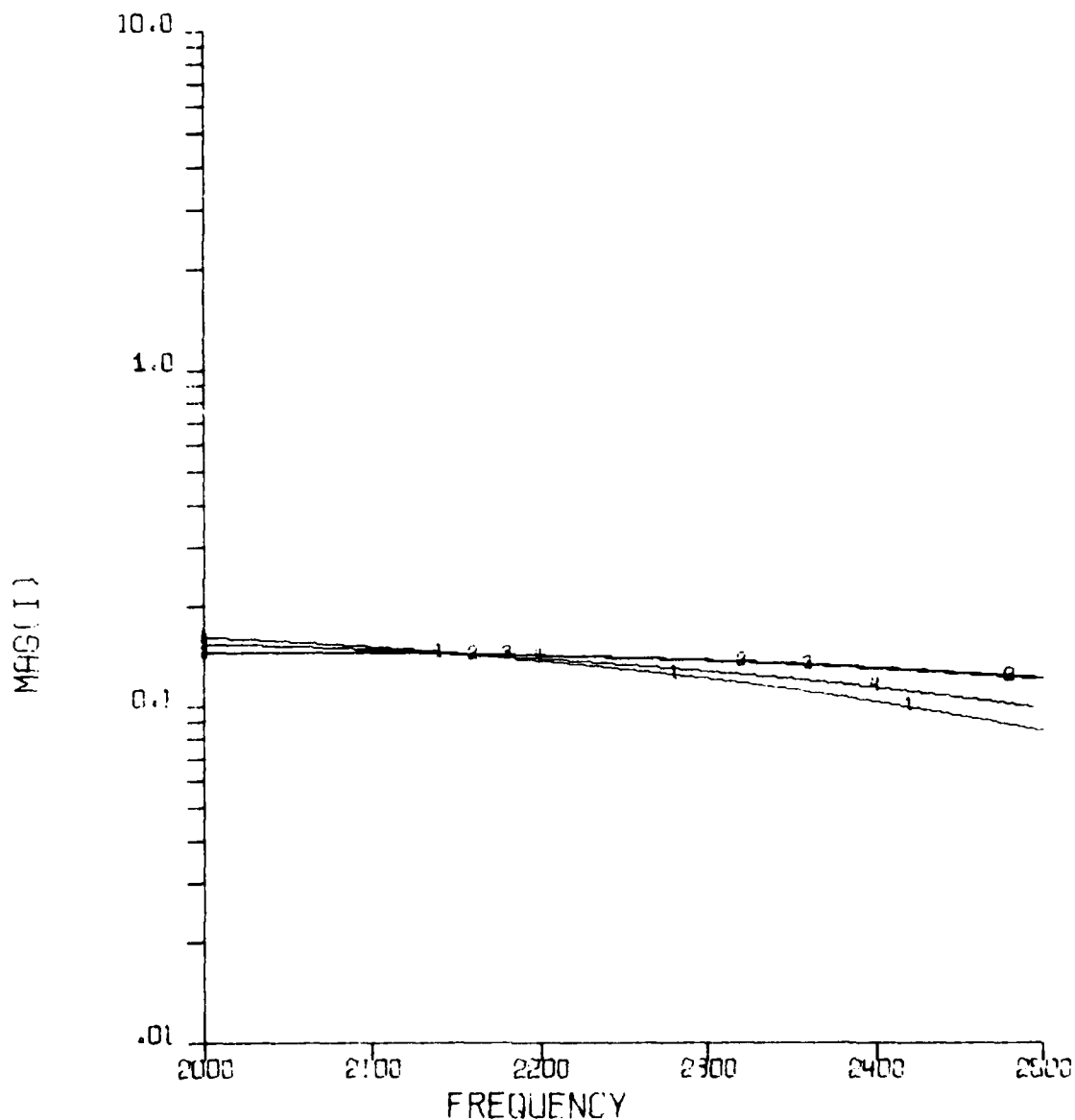
NEL DUMLOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 OP=E+50 LS=.5005 QS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

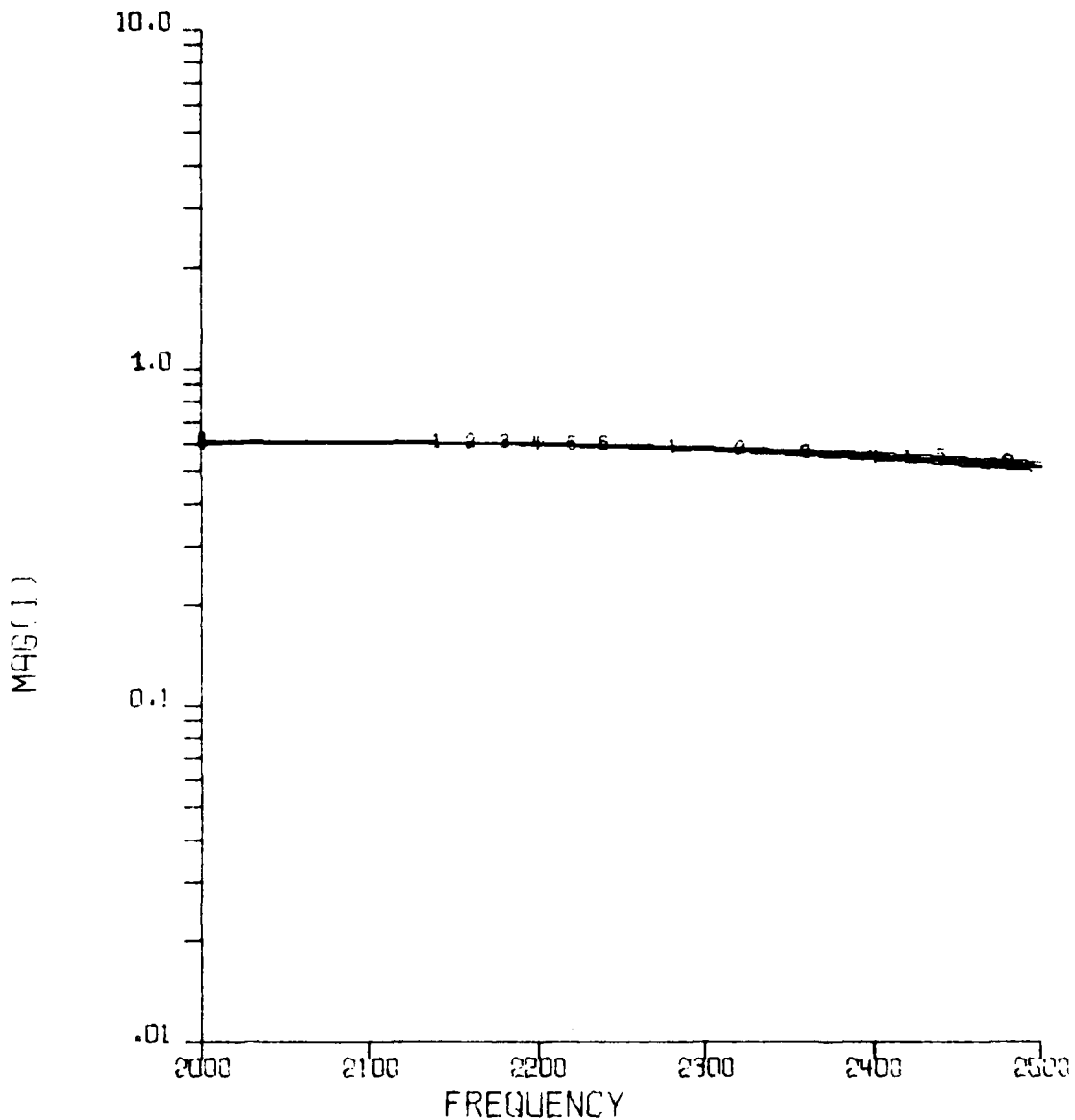
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

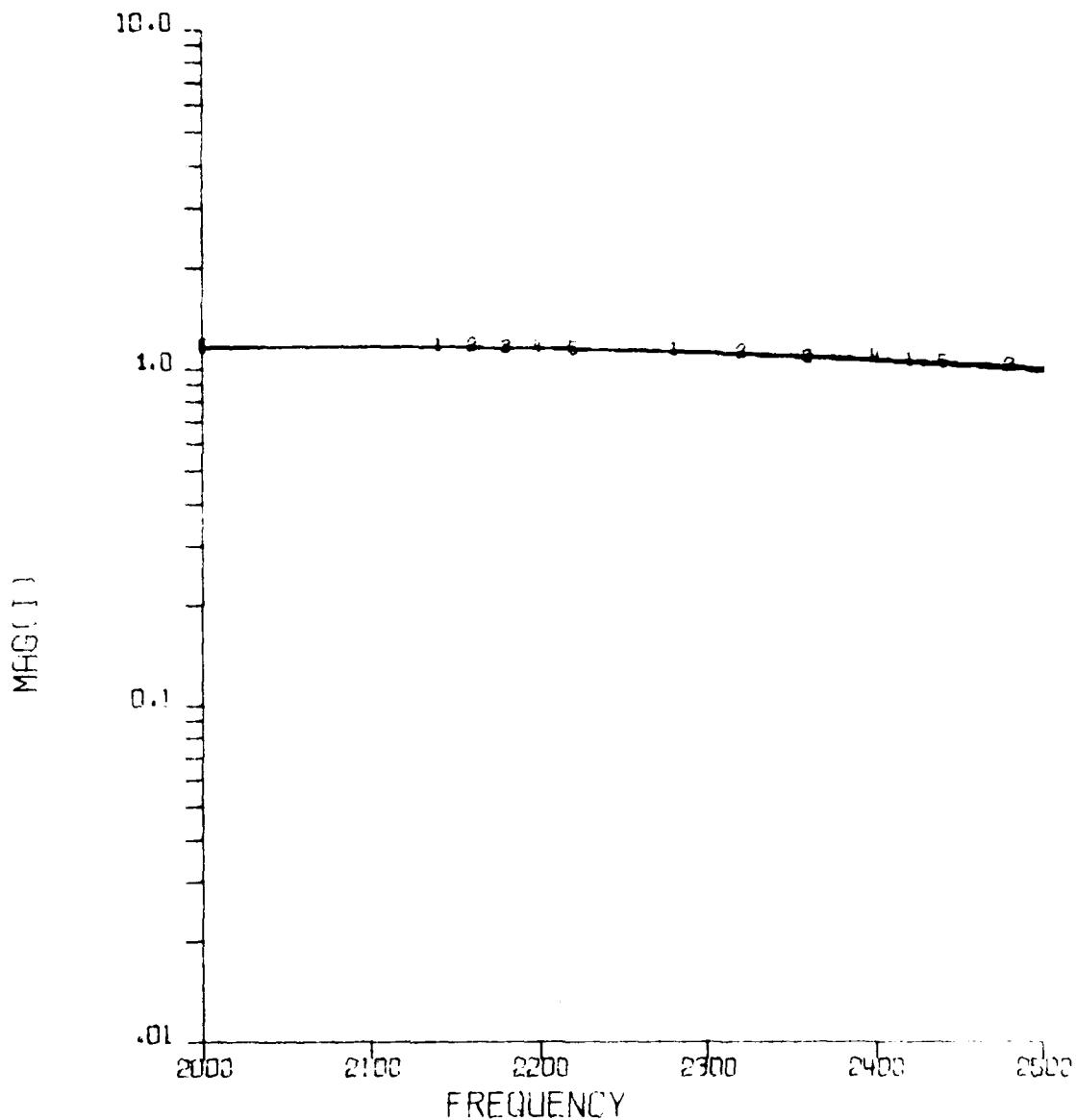
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E 4+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

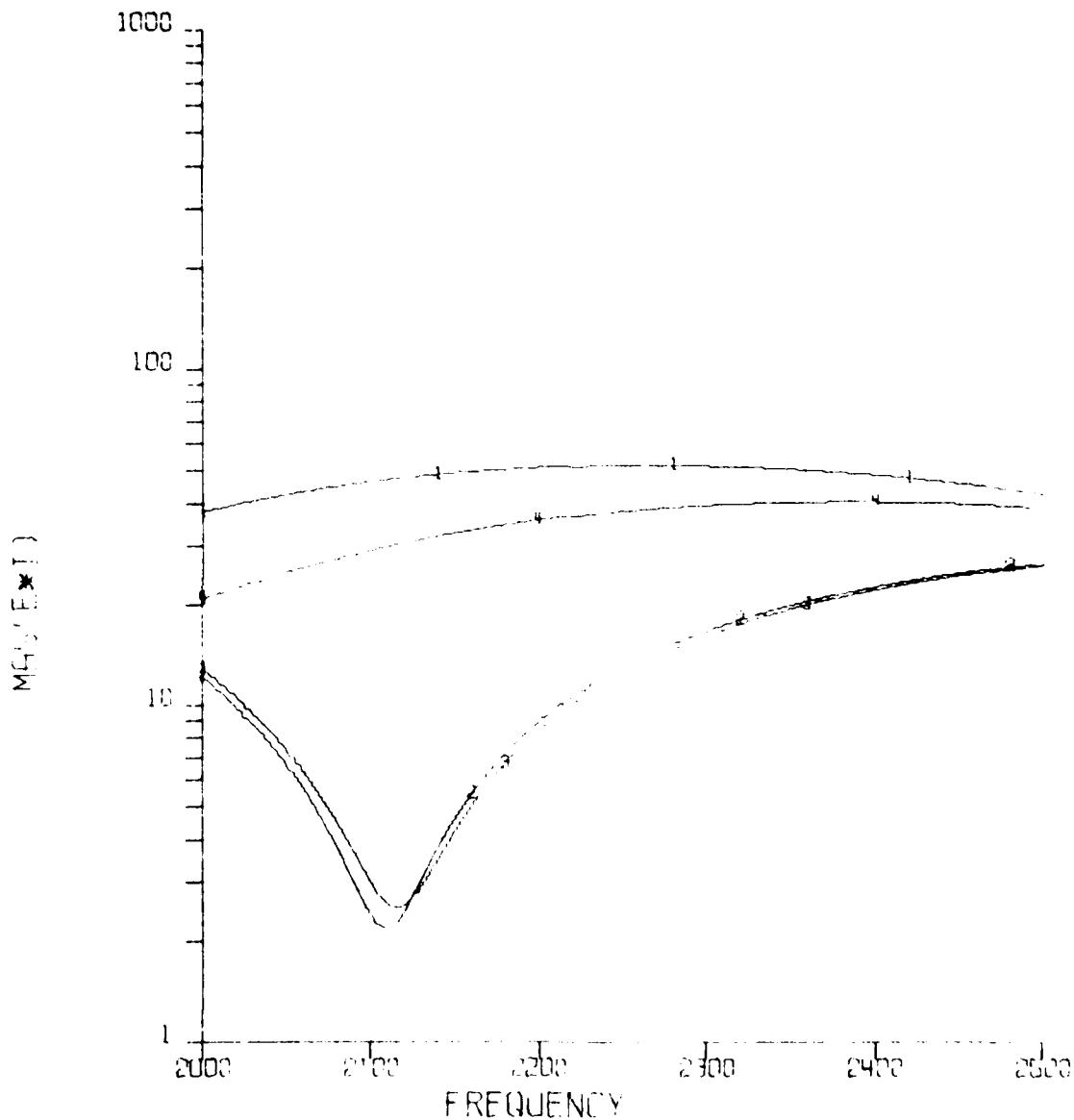
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

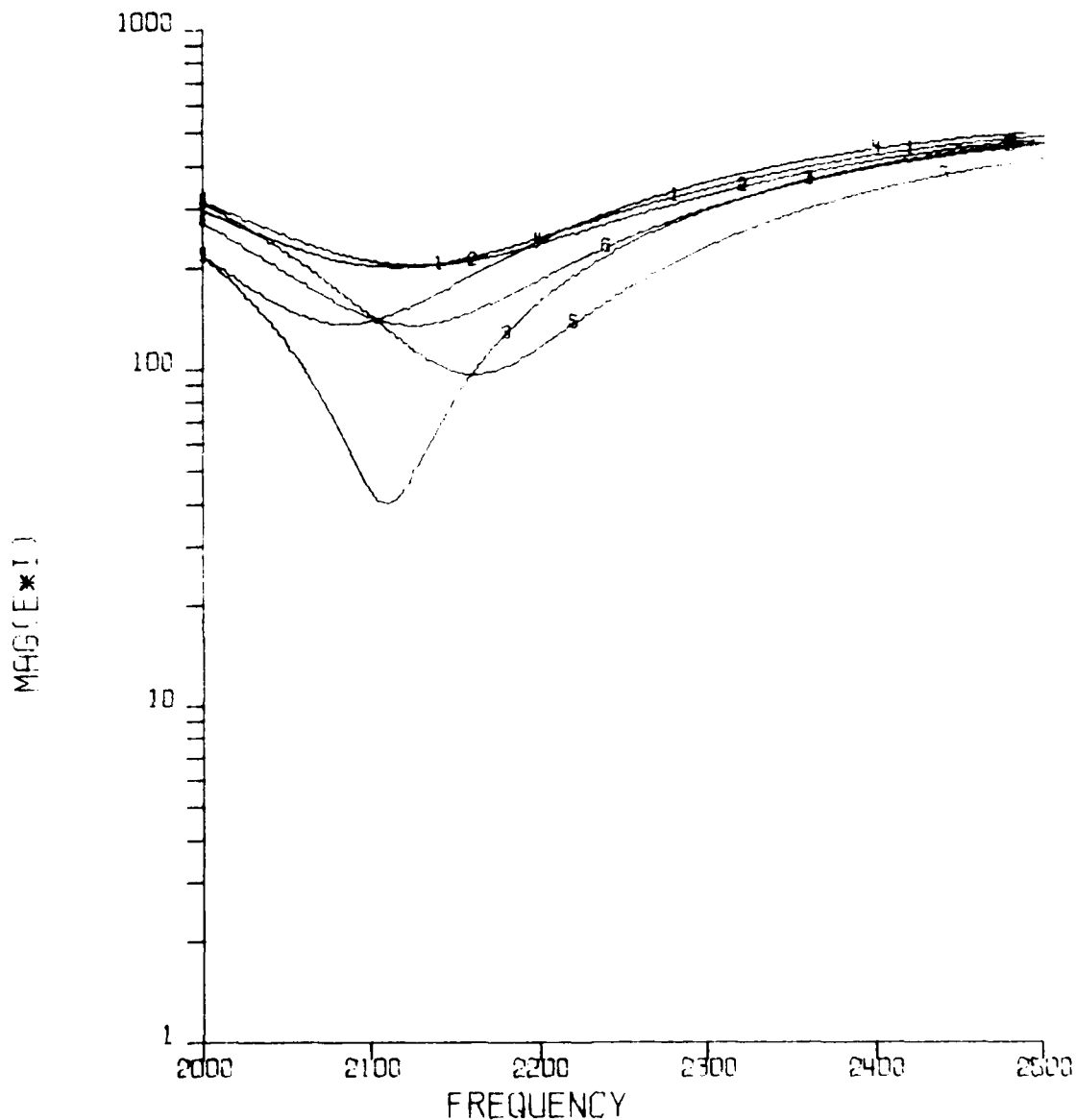
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

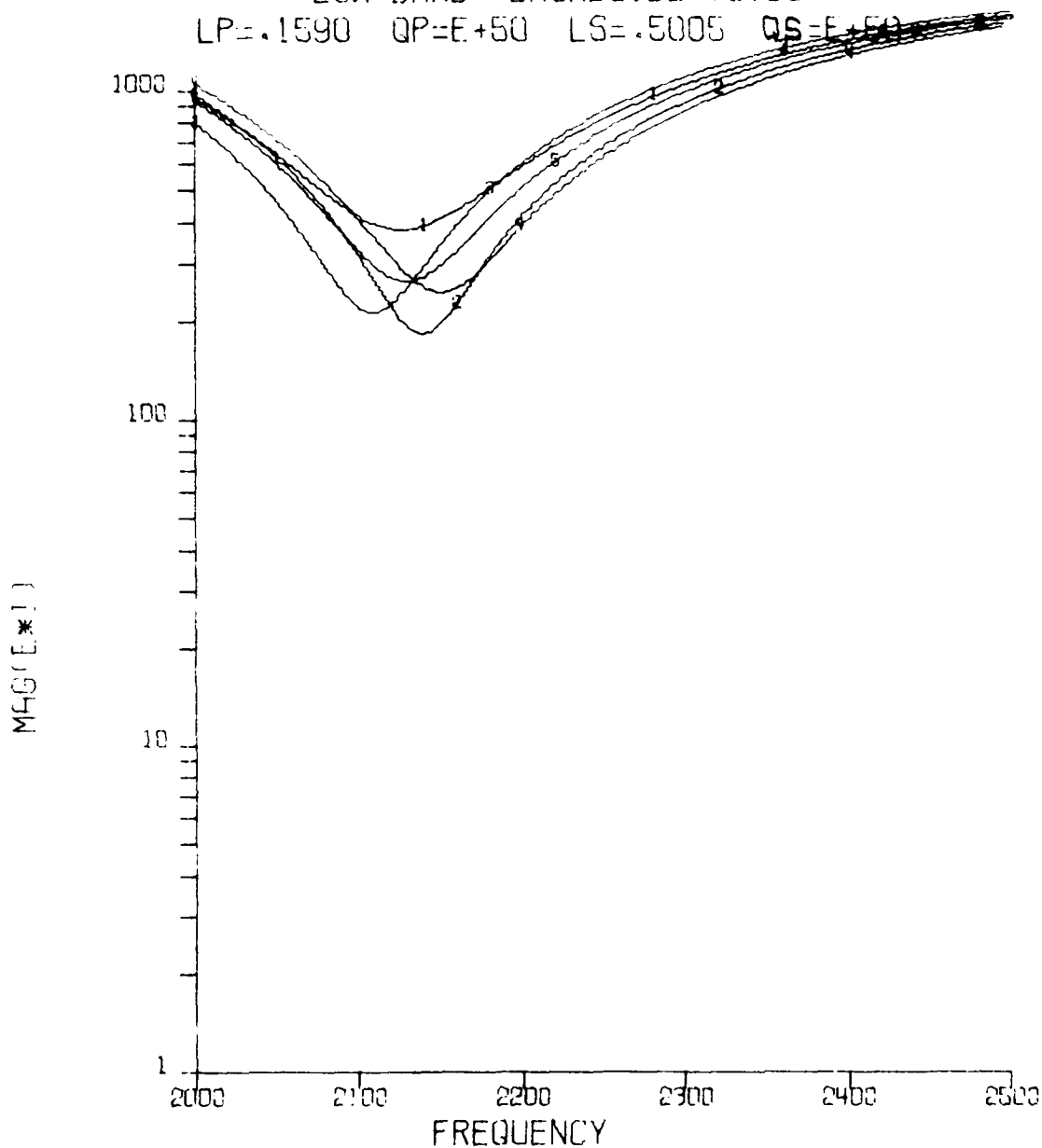
NEL DUMILORD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

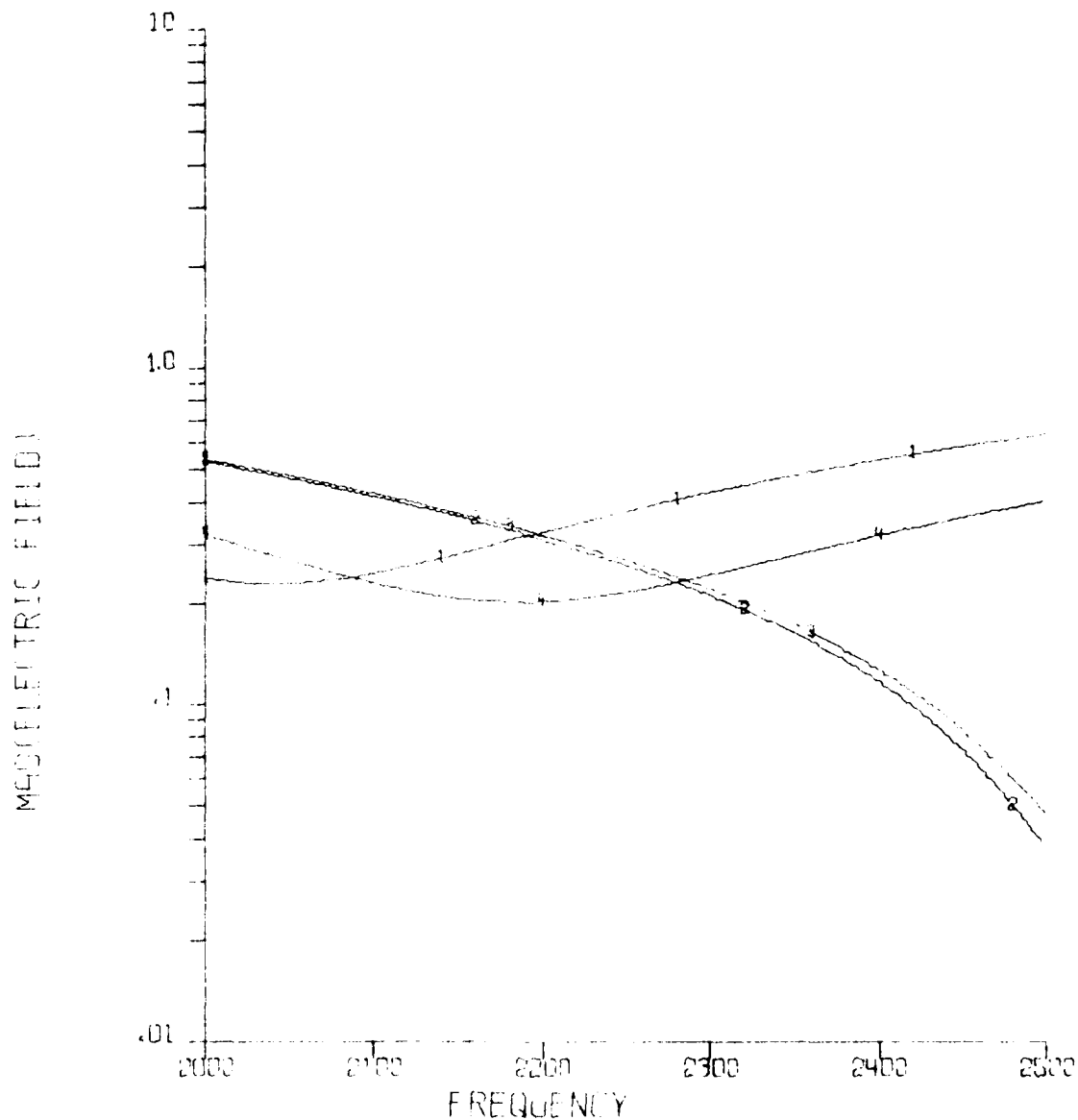
NEL DUMIL 3AD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES	=	8.62318751E03+J3.54954775E03
CURVE 2 - MIN R	=	4.04152567E03+J1.58332185E03
CURVE 3 - MAX X	=	4.71313038E03+J6.22775241E03
CURVE 4 - MIN X	=	5.48191309E03-J1.07796008E02
CURVE 5 - AVG	=	5.32082810E03+J3.08428731E03

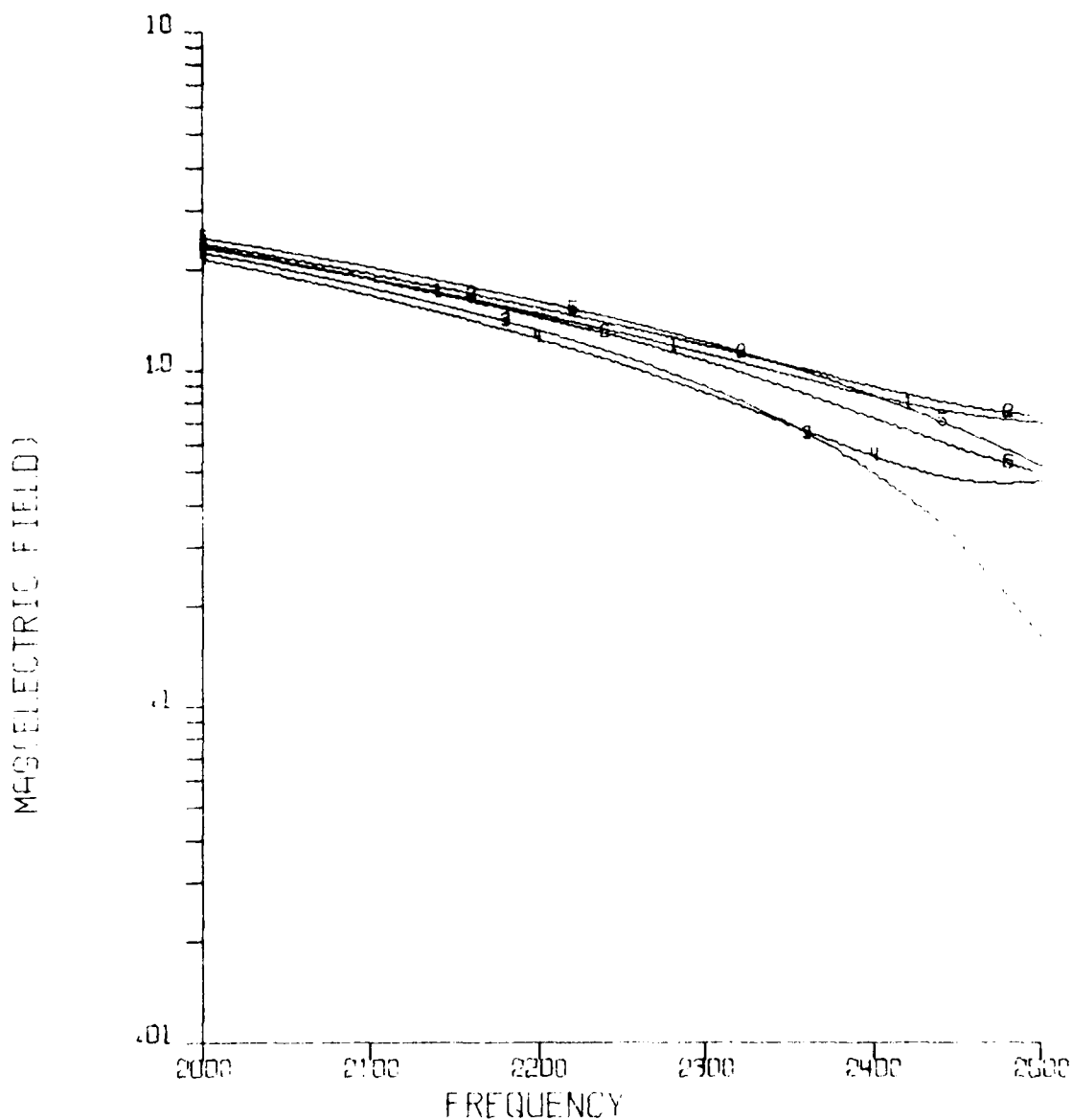
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 MAX PREF=3.09590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 MIN X 3.57300970E03+J5.19126037E03
 CURVE 4 AVG 2.44205725E04+J4.33216357E04

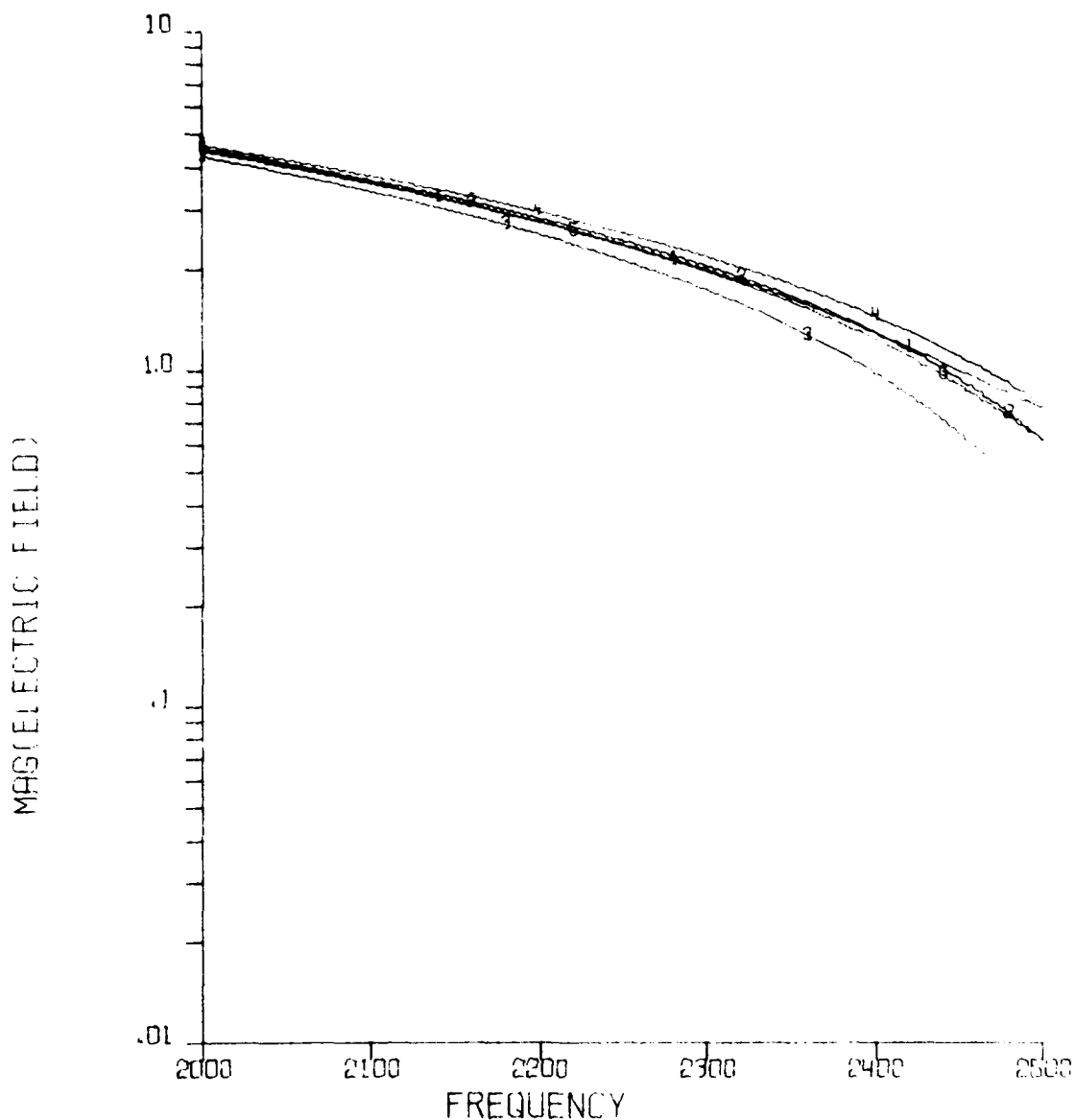
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1	MAX PRES	$-1.70359401E04 + J5.28297277E05$
CURVE 2	MAX R	$-1.72759279E04 + J3.19188898E05$
CURVE 3	MIN R	$-3.18166958E03 + J6.18375532E03$
CURVE 4	MAX X	$-1.14610761E04 + J1.00632376E04$
CURVE 5	MIN X	$-8.0960299E03 + J1.58026357E03$
CURVE 6	AVG	$-1.14146599E04 + J3.81251049E03$

NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LP=.1590 QP=E+50 LS=.5005 QS=E+50



MAGNETIC FIELD VERSUS FREQUENCY

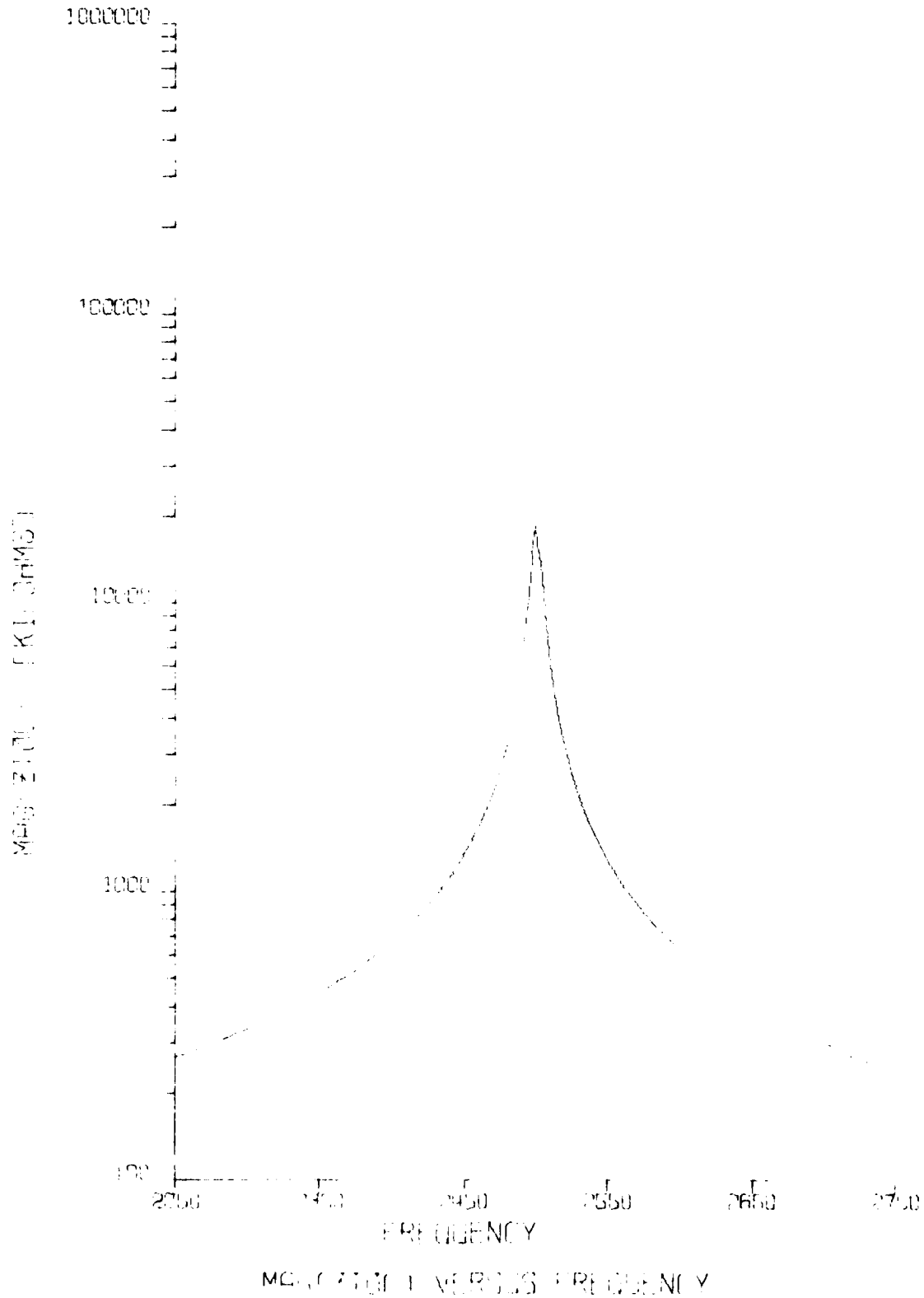
CURVE 1 - MAX PRES	=	8.62318751E03+J3.54954775E03
CURVE 2 - MIN R	=	4.04152567E03+J1.58332185E03
CURVE 3 - MAX X	=	4.71313038E03+J6.22775241E03
CURVE 4 - MIN X	=	5.48191309E03-J1.07796008E02
CURVE 5 - AVG	=	5.92092810E03+J3.08428731E03

TRACOR, INC.

MID BAND

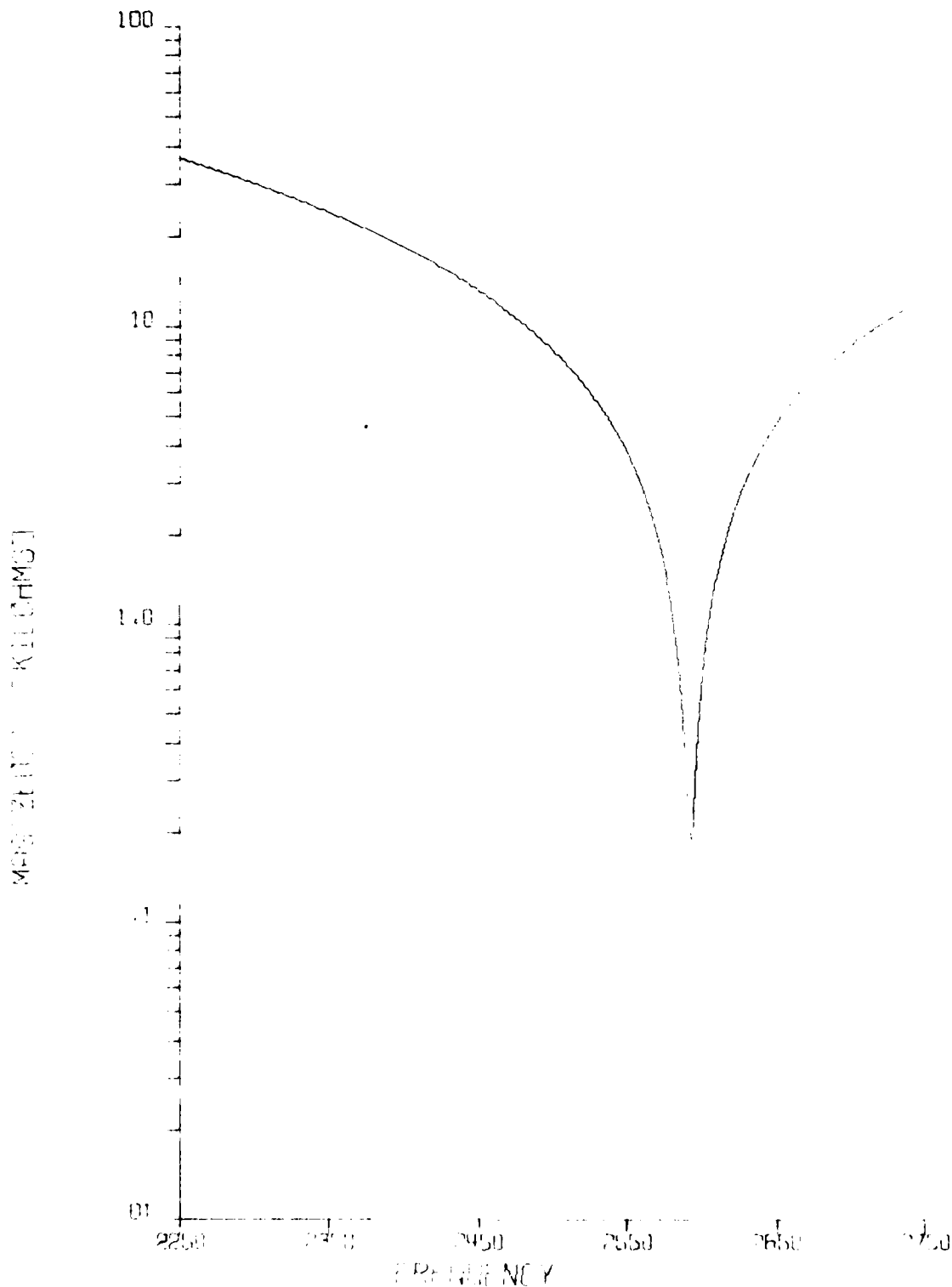
NET DUMILCHU 1
C.P. 1 5 INCH CIRCULAR HEAD
MID BAND

LP=.3904 QP=E+50 LS=.0000 QS=E+50



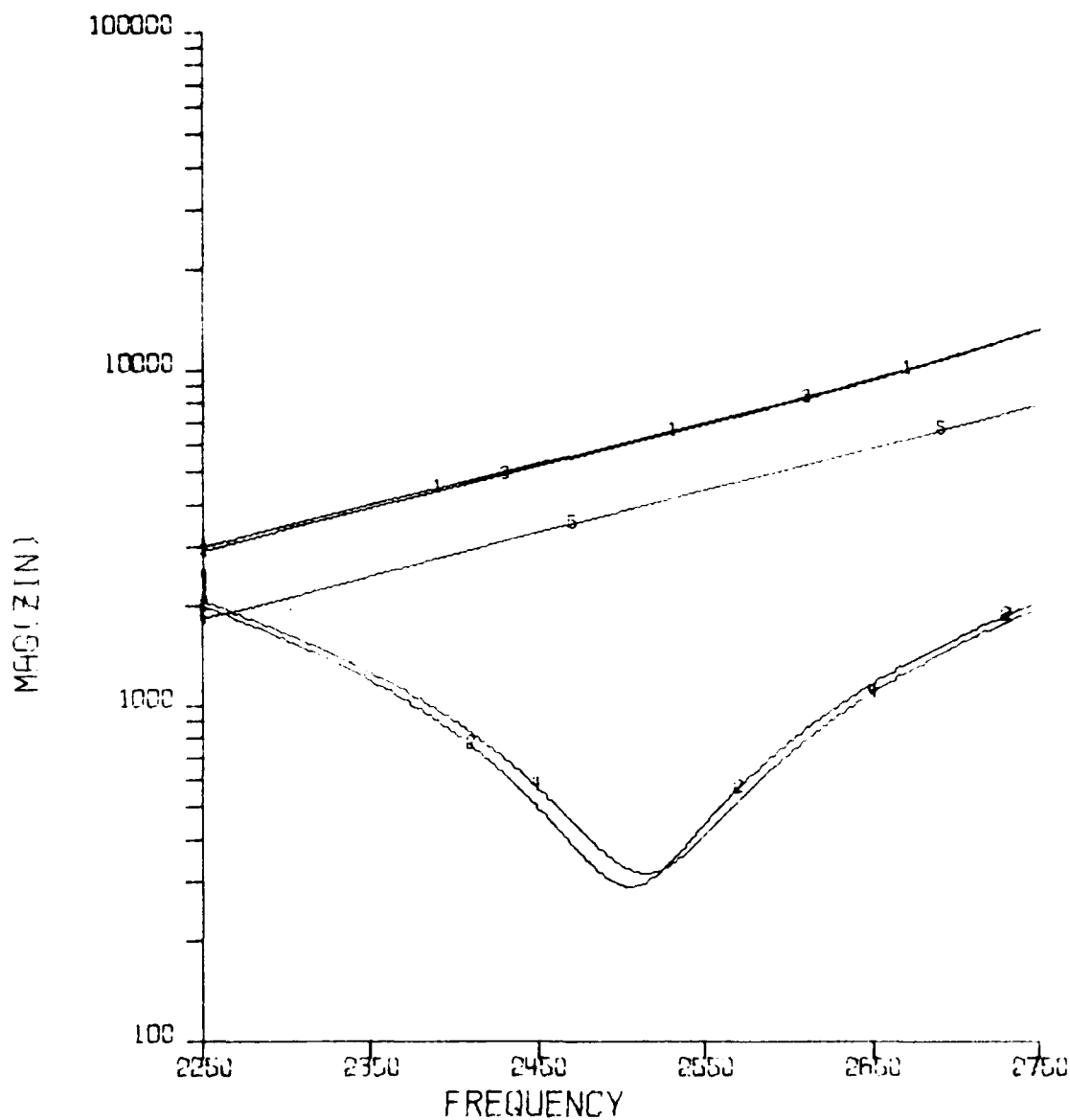
NET DUMILUHD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND

LP=.3904 GP=E+50 LS=.0000 QS=E+50



MAGNITUDE VERSUS FREQUENCY

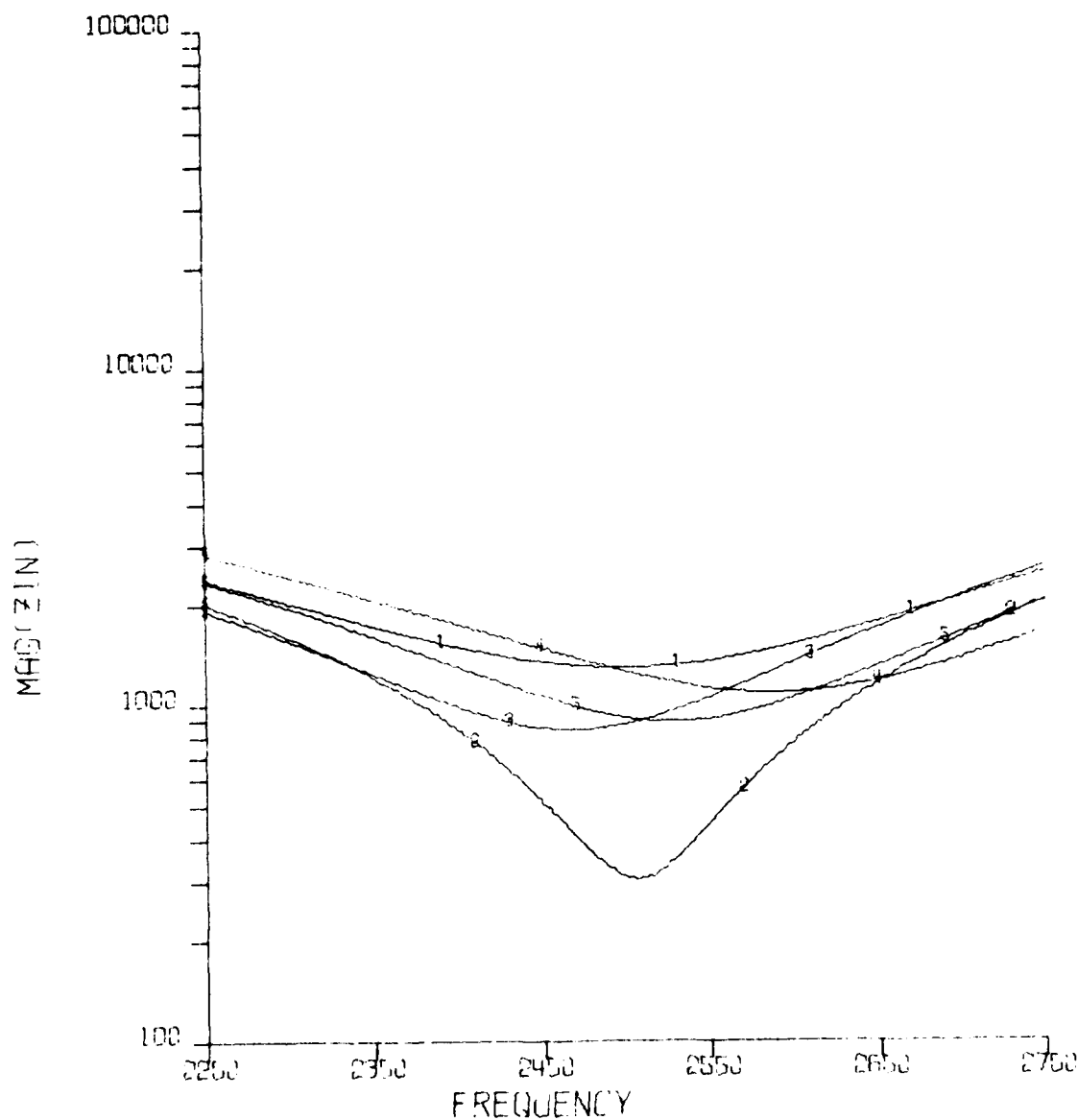
NEL DUMILORD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

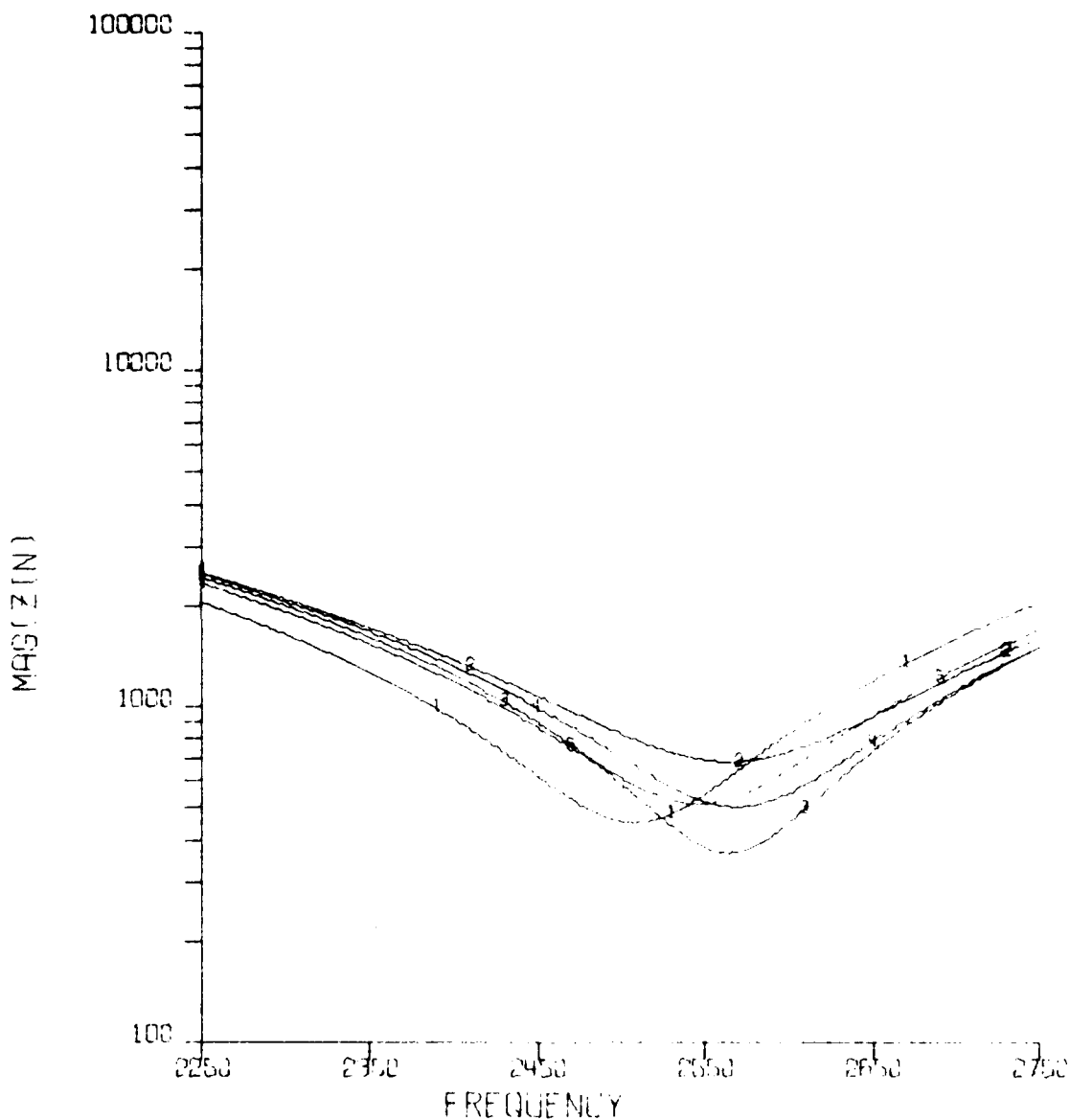
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

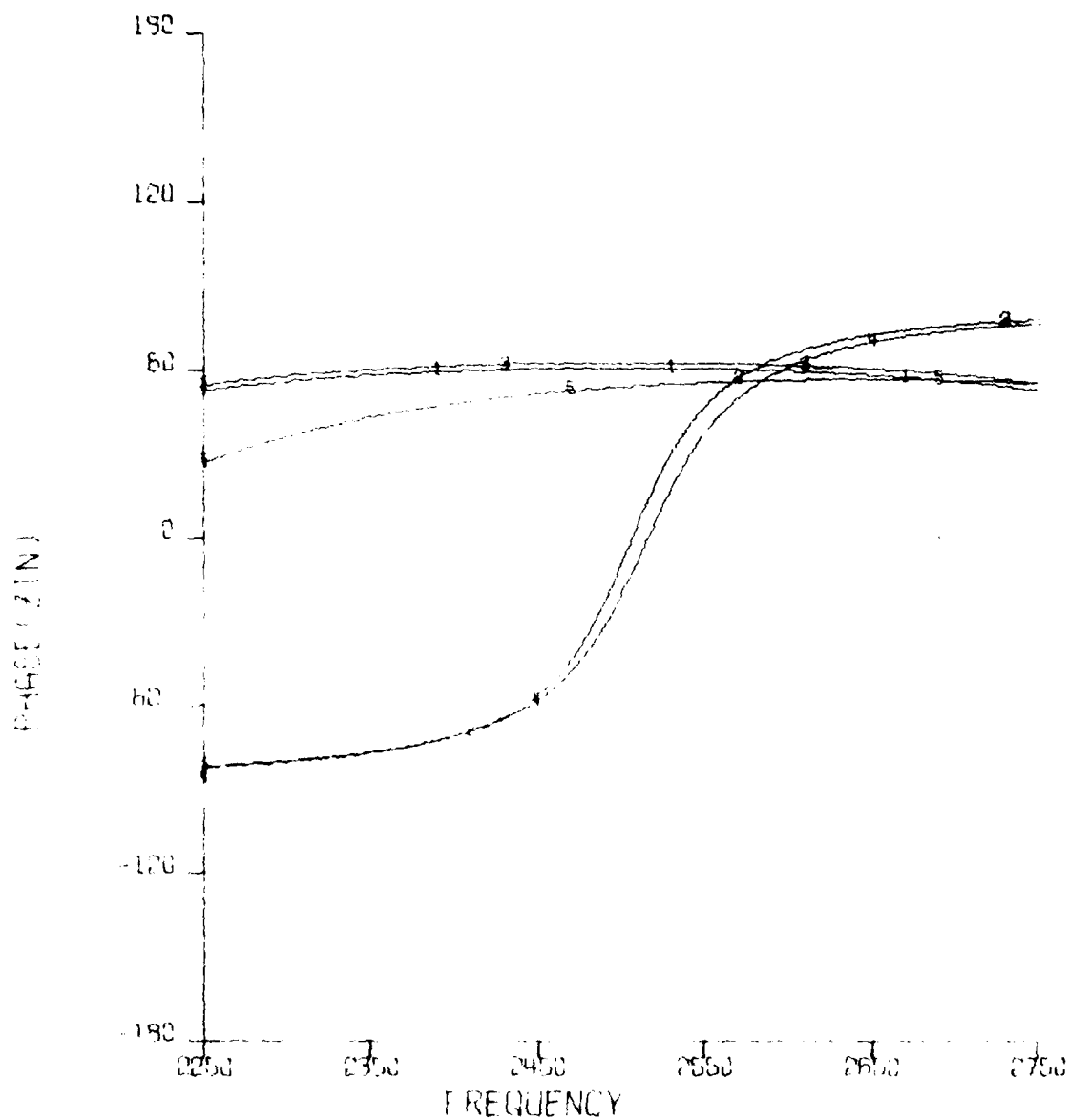
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG|Z(N) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50501644E03+J17.43463919E03
 CURVE 2 - MAX R =9.18015867E03+J17.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J17.39239074E03
 CURVE 4 - MIN X =5.94411635E03+J17.82753326E03
 CURVE 5 - AVG =6.13526311E03+J17.81425445E03

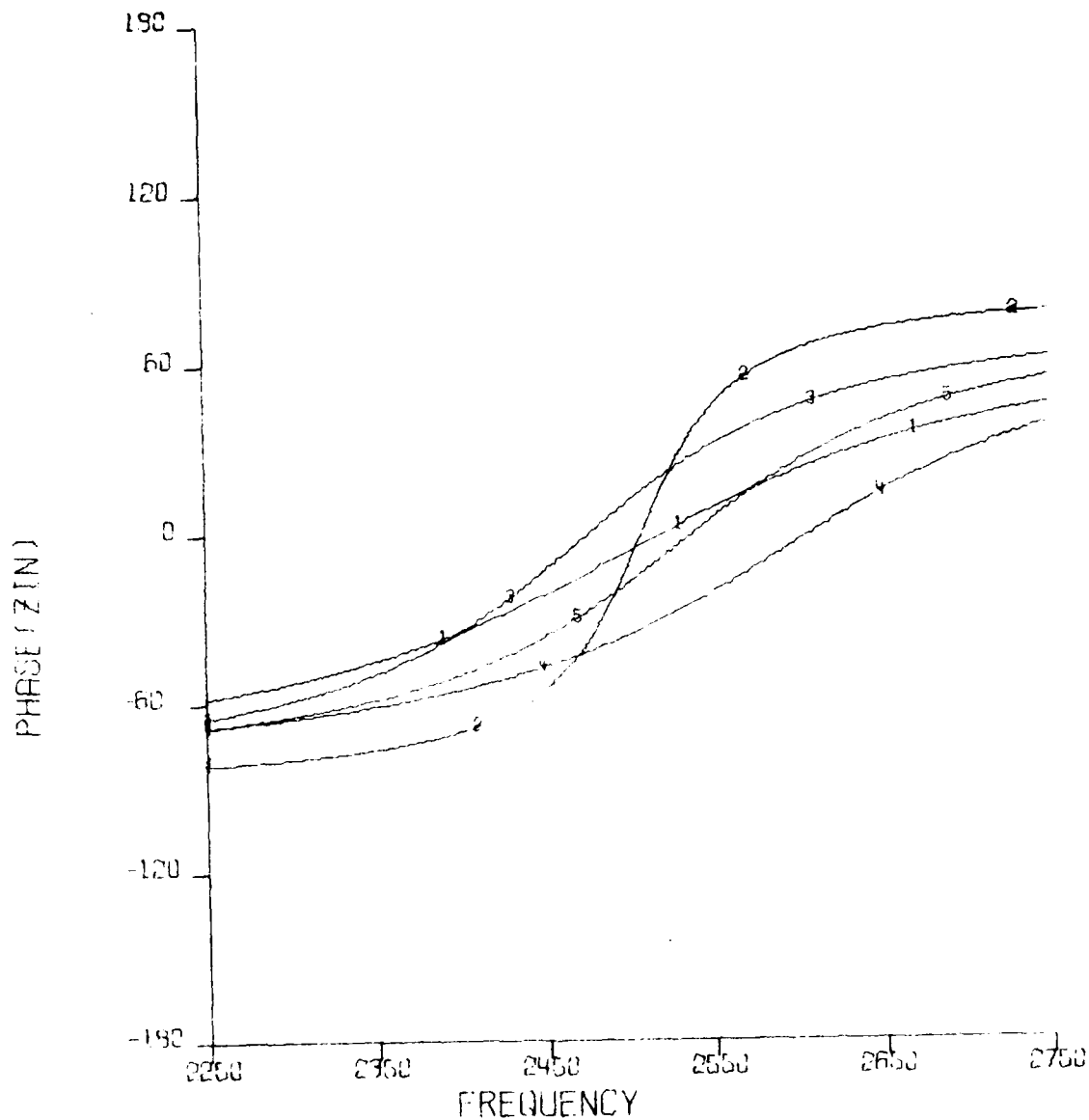
NEL DUMILORD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (D.O)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 MAX PRES. $3.70634046E04 + j7.66828215E04$
 CURVE 2 MIN R $=3.49842781E03 + j7.81806304E03$
 CURVE 3 MAX X $=3.43145191E04 + j7.70014372E04$
 CURVE 4 MIN X $=3.30512498E03 + j6.31990765E03$
 CURVE 5 AVG $=3.81536941E04 + j4.83015084E04$

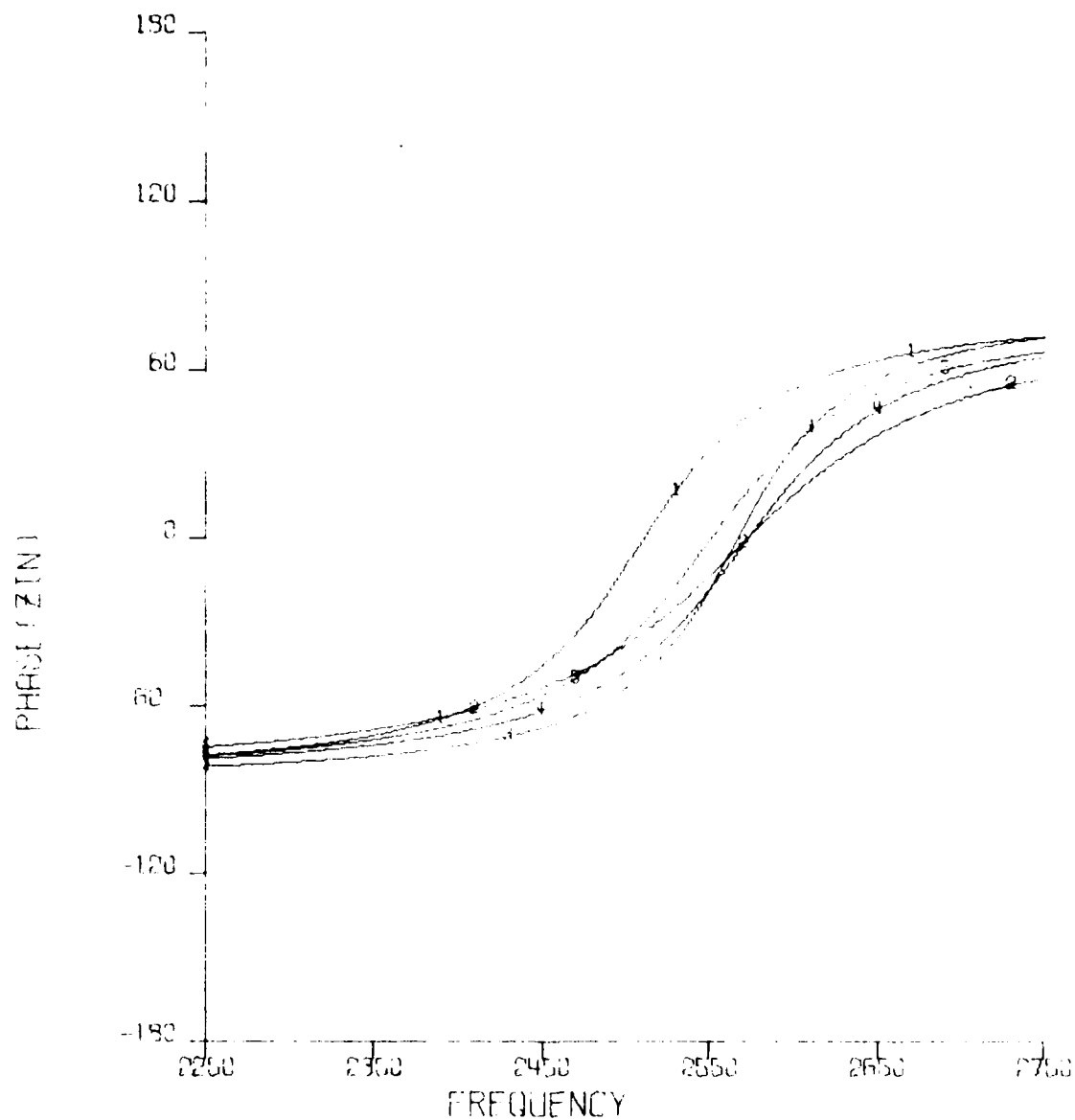
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038637E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

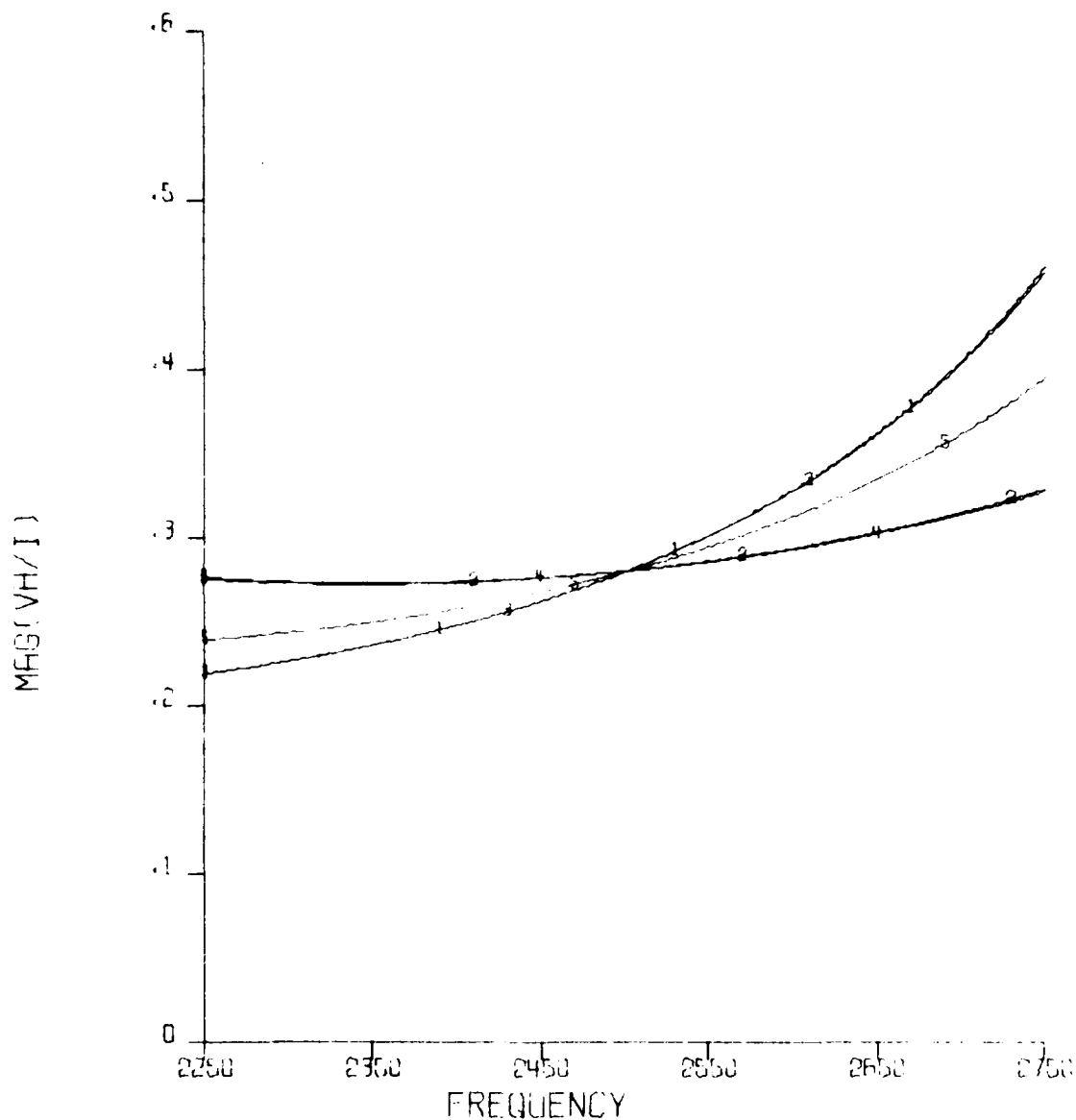
NEL DUMIL QAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1	-	MAX	PRES	=	5.50801644E03+J7.43460919E03
CURVE 2	-	MAX	R	=	8.18015867E03+J1.90754574E03
CURVE 3	-	MIN	R	=	4.27851865E03+J2.38230074E03
CURVE 4	-	MIN	X	=	5.94411695E03+J1.82753326E03
CURVE 5	-	AVG		=	6.13526311E03+J3.81425445E03

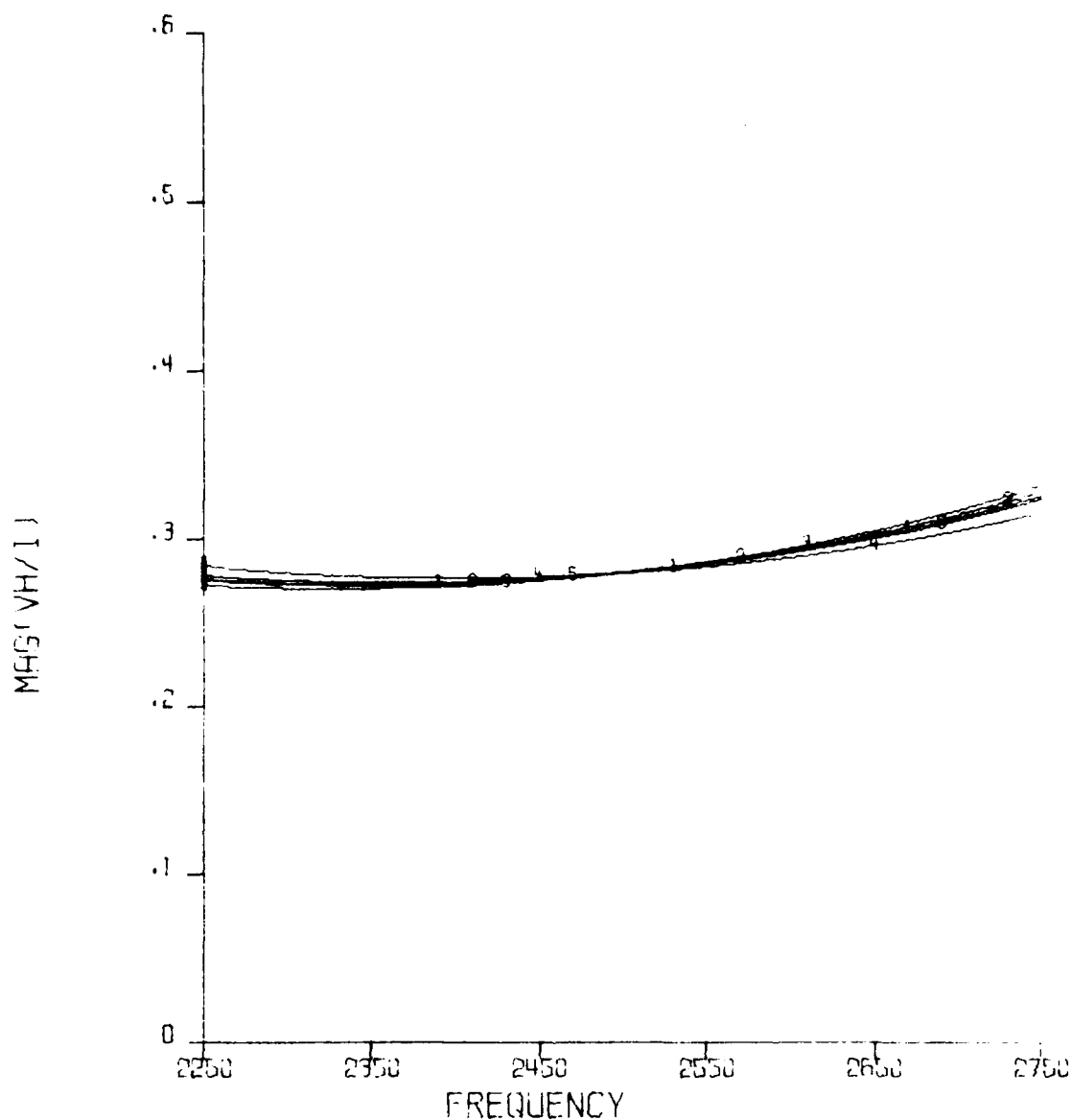
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70634046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.31990765E03
 CURVE 5 - AVG =2.81596941E04+J4.83015054E04

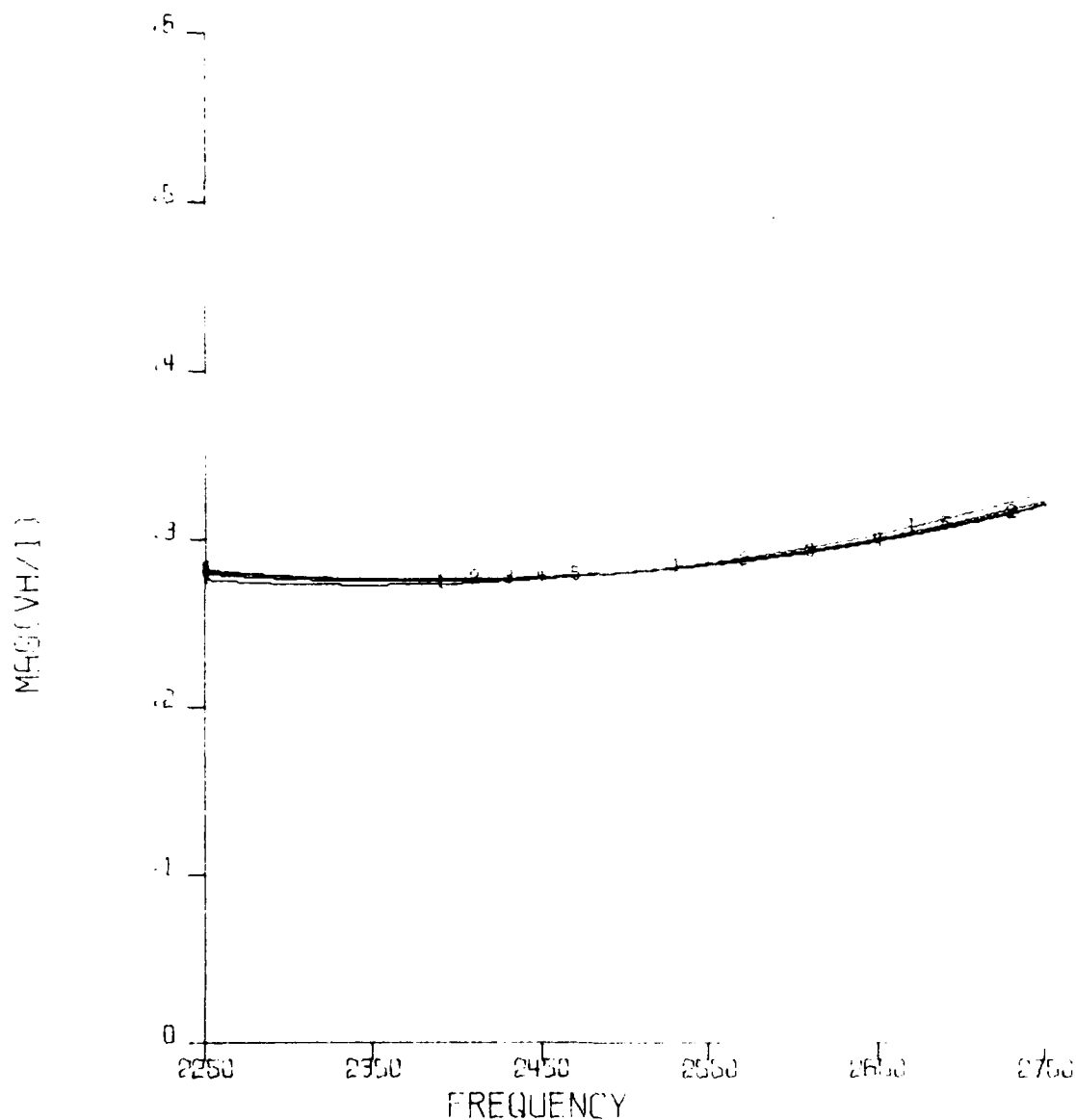
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038637E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

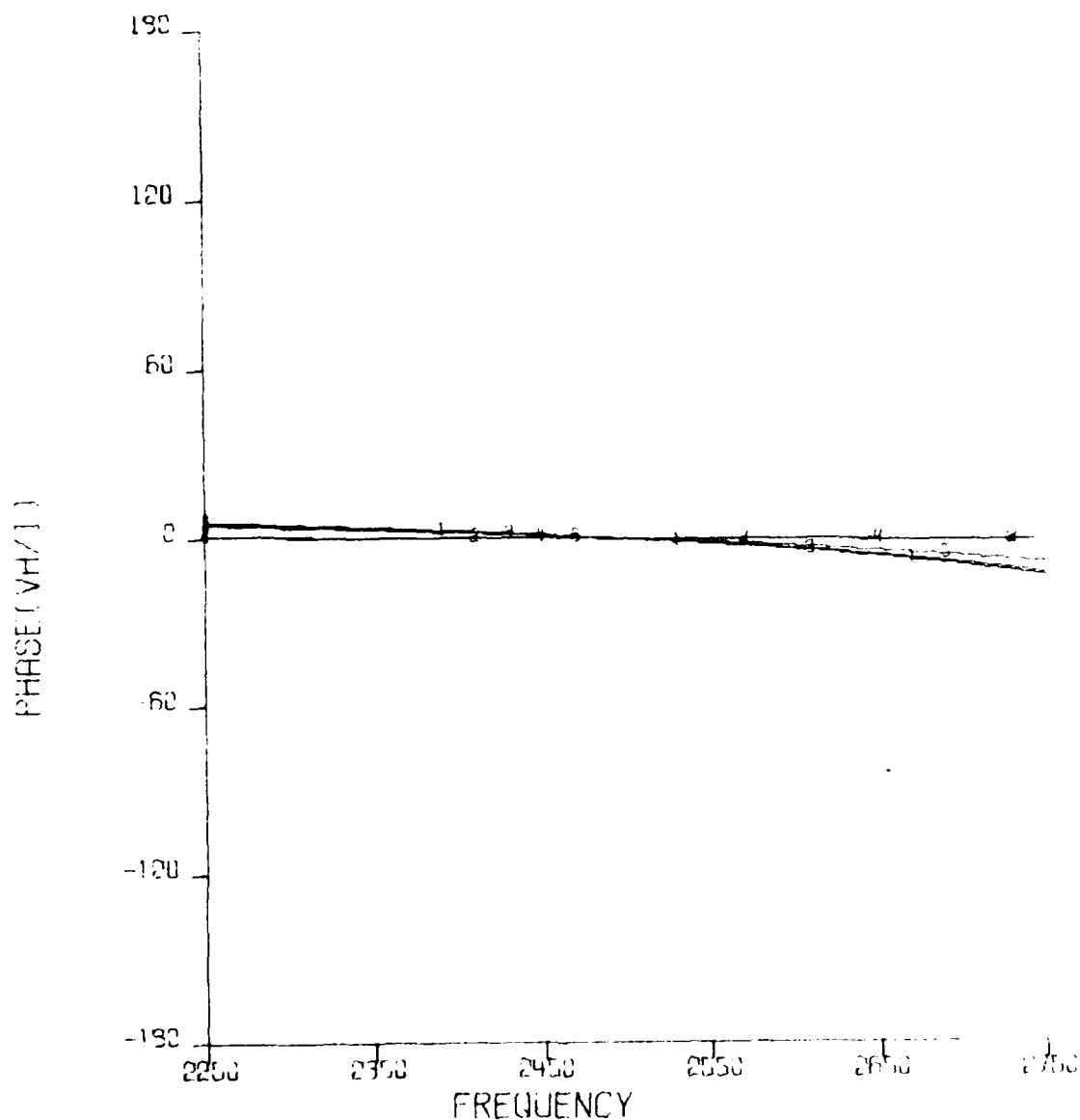
NEL DUMILORD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE 10.90
 LP=.3904 OP=E+50 LS=.0000 OS=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43483919E03
 CURVE 2 - MAX R =8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411835E03+J1.82753326E03
 CURVE 5 - AVG =6.13526311E03+J3.81425445E03

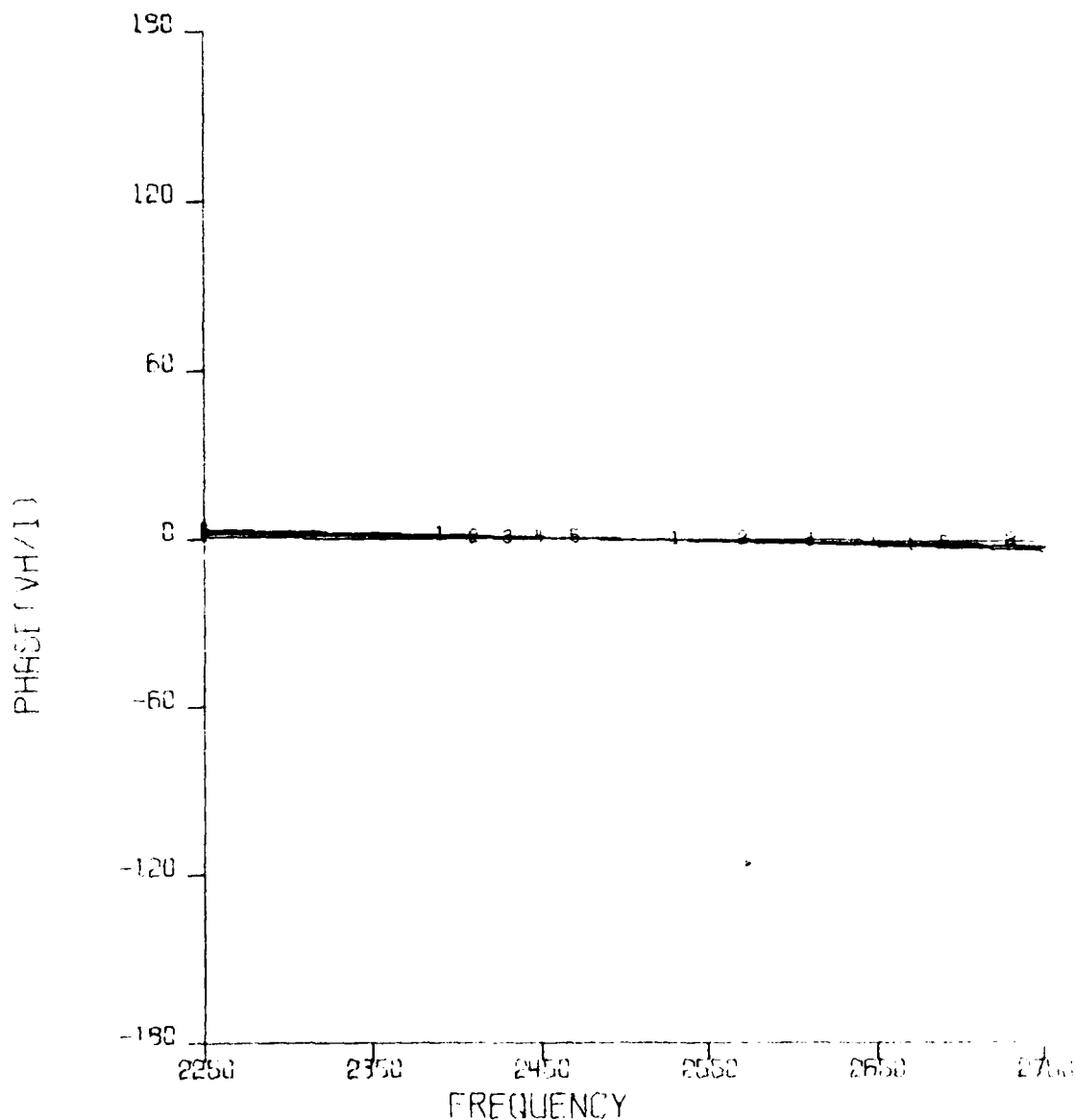
NEL DUMIL QAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE 10.01
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70634046E04+J7.6682821E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

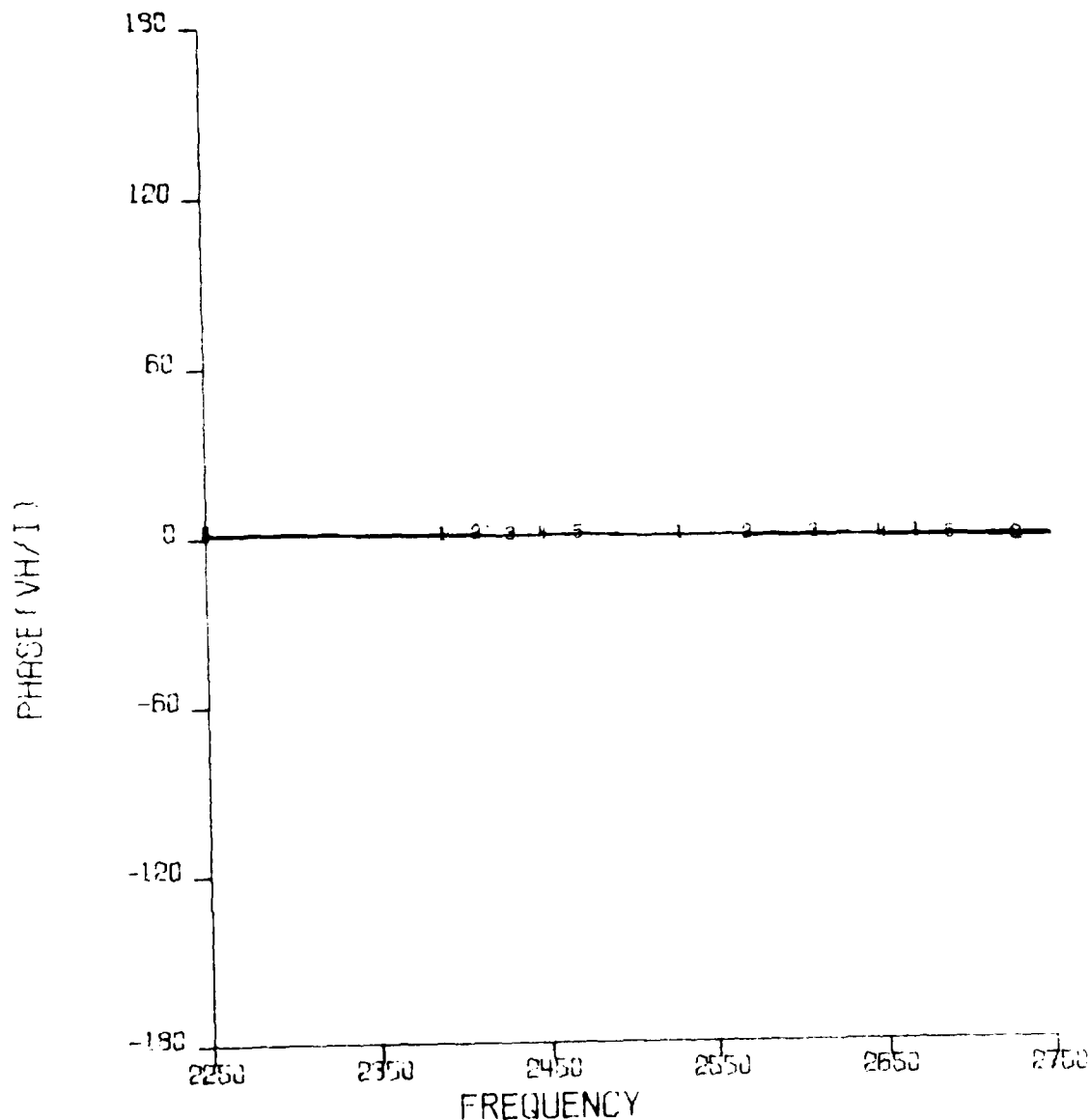
NEL DUMIL 3AD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04+J9.95386351E03
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

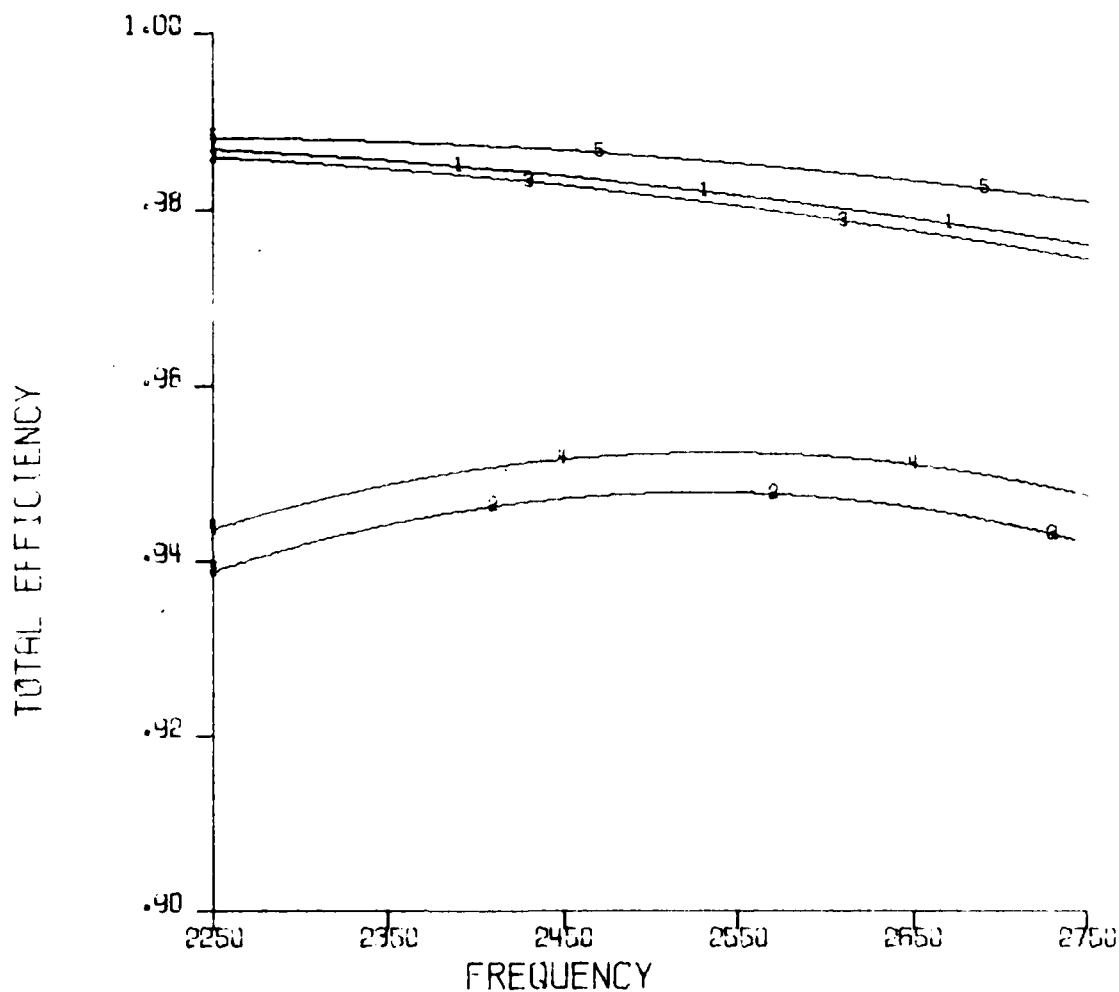
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3904 QP=E+50 LS=.0000 OS=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43463919E03
 CURVE 2 - MAX R =8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411695E03+J1.82753326E03
 CURVE 5 - AVG =6.13526911E03+J3.81425445E03

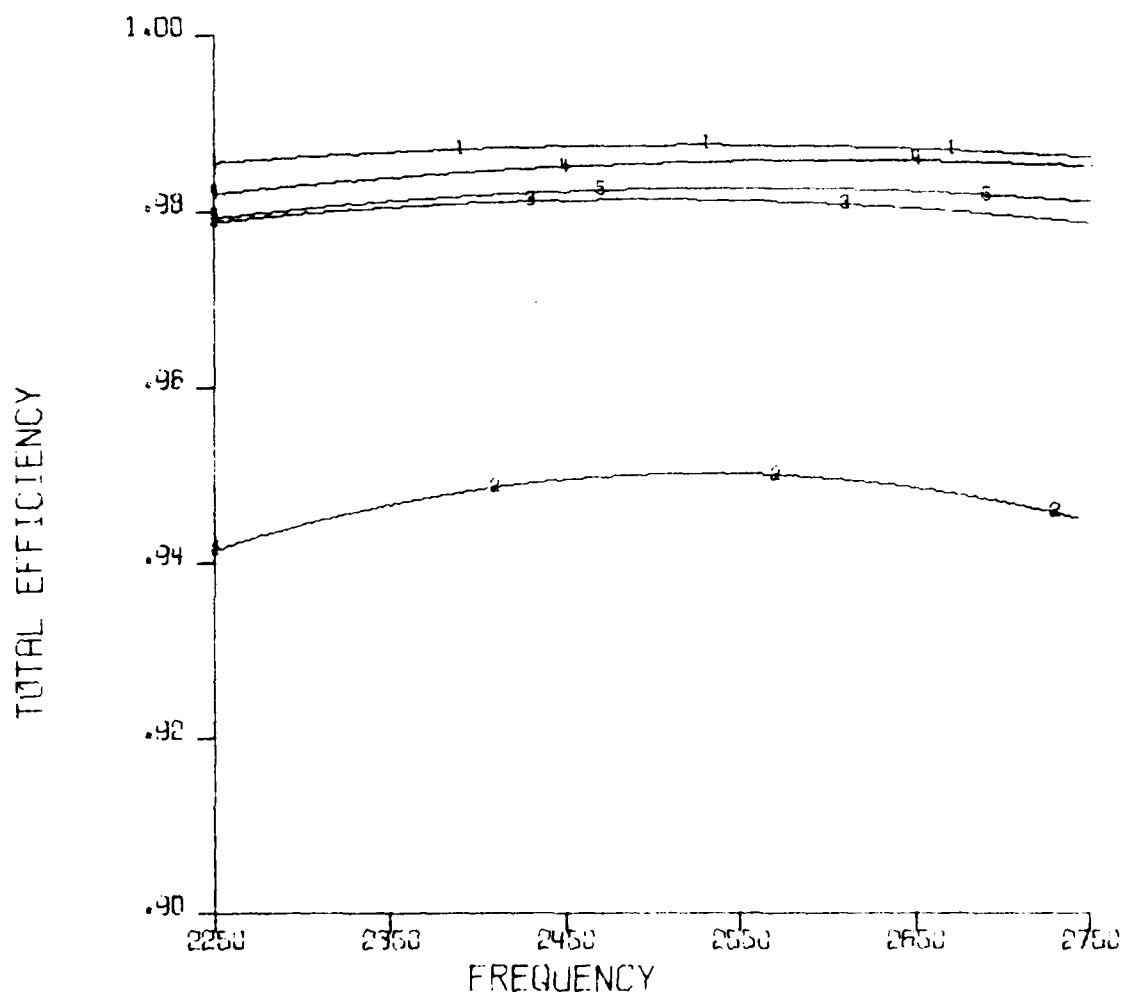
NEL DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

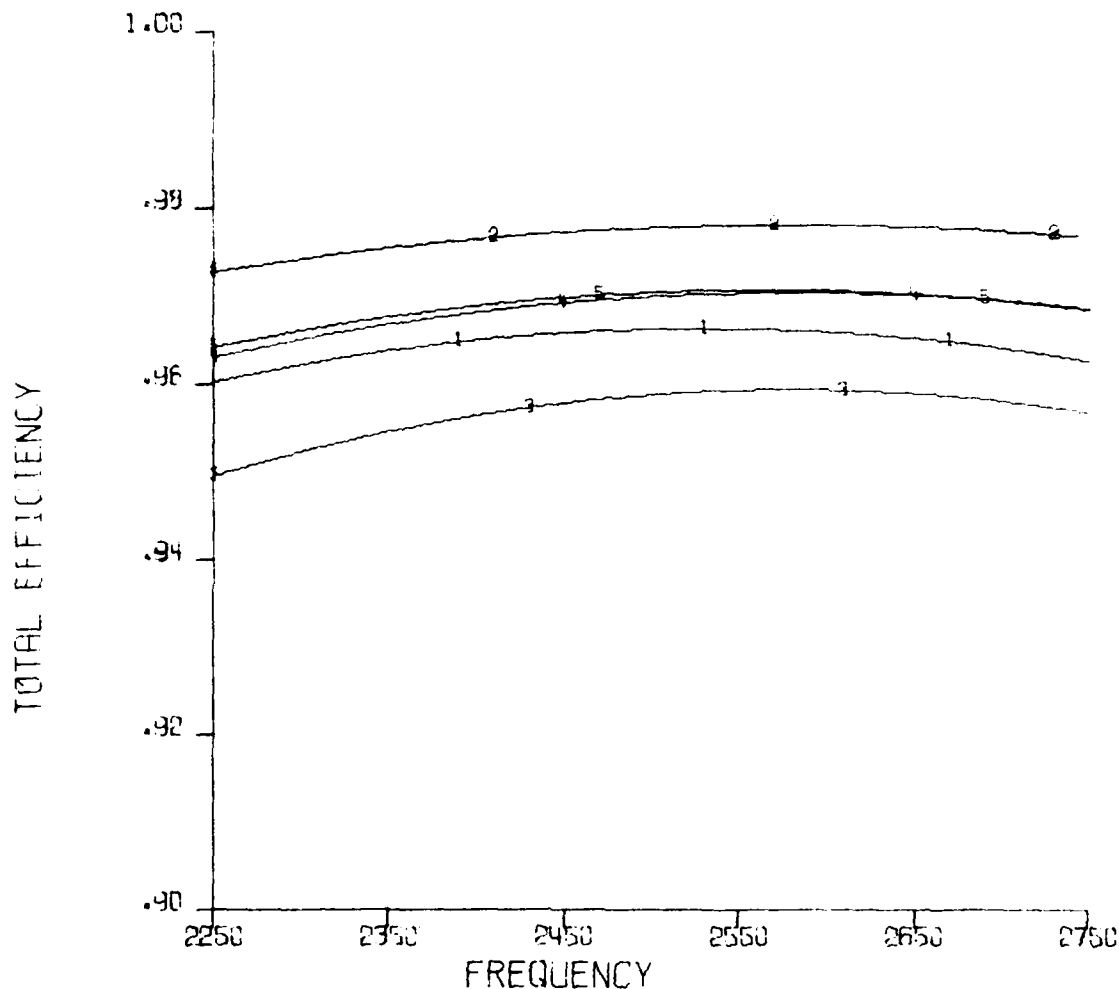
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

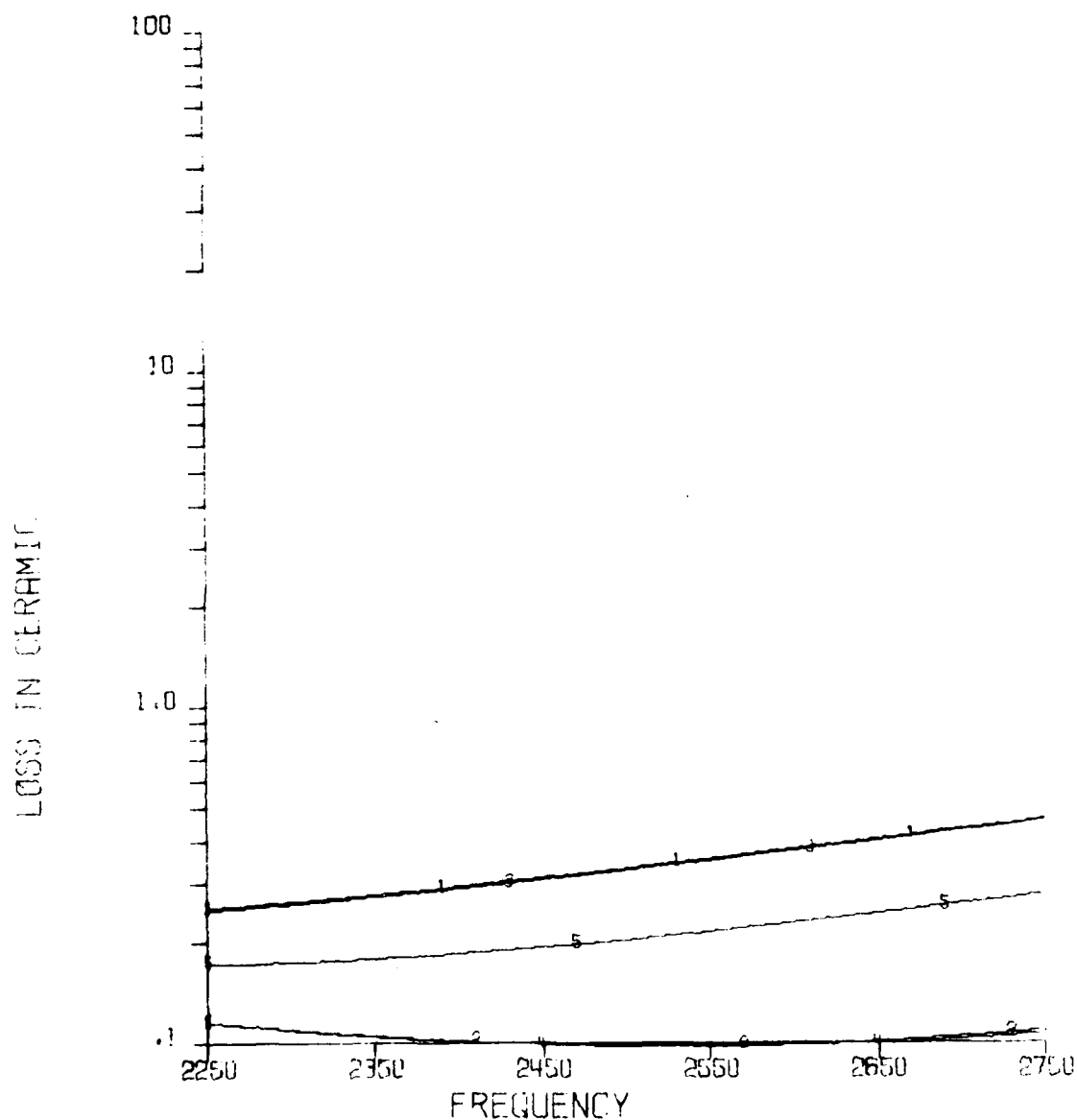
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3904 OP=E+50 LS=.0000 OS=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43463919E03
 CURVE 2 - MAX R =8.19015967E03+J1.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411695E03+J1.82753326E03
 CURVE 5 - AVG =6.13526911E03+J3.31425445E03

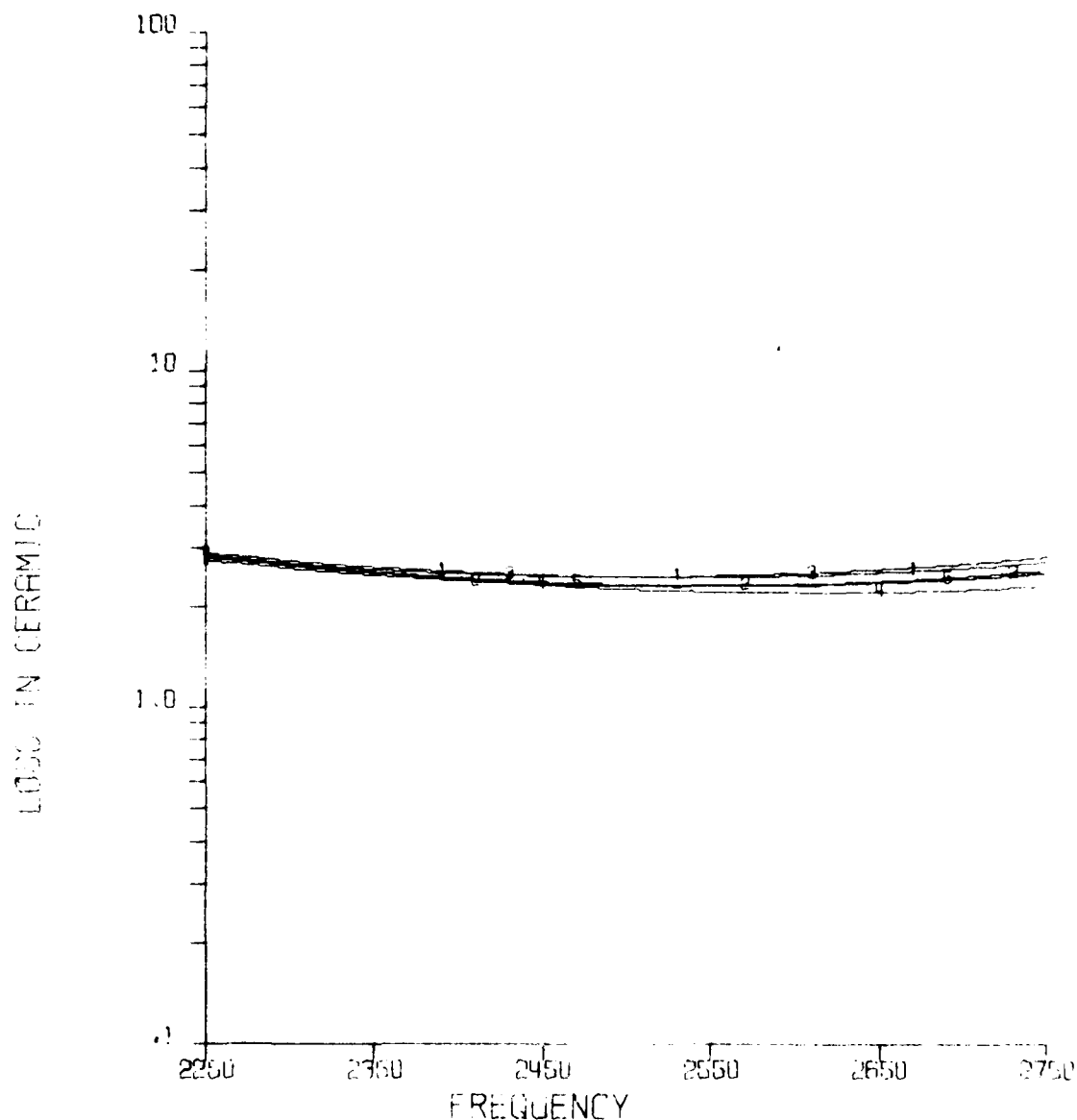
NEL DUMILQAD J
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3904 QP=E+50 LS=.0000 CS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

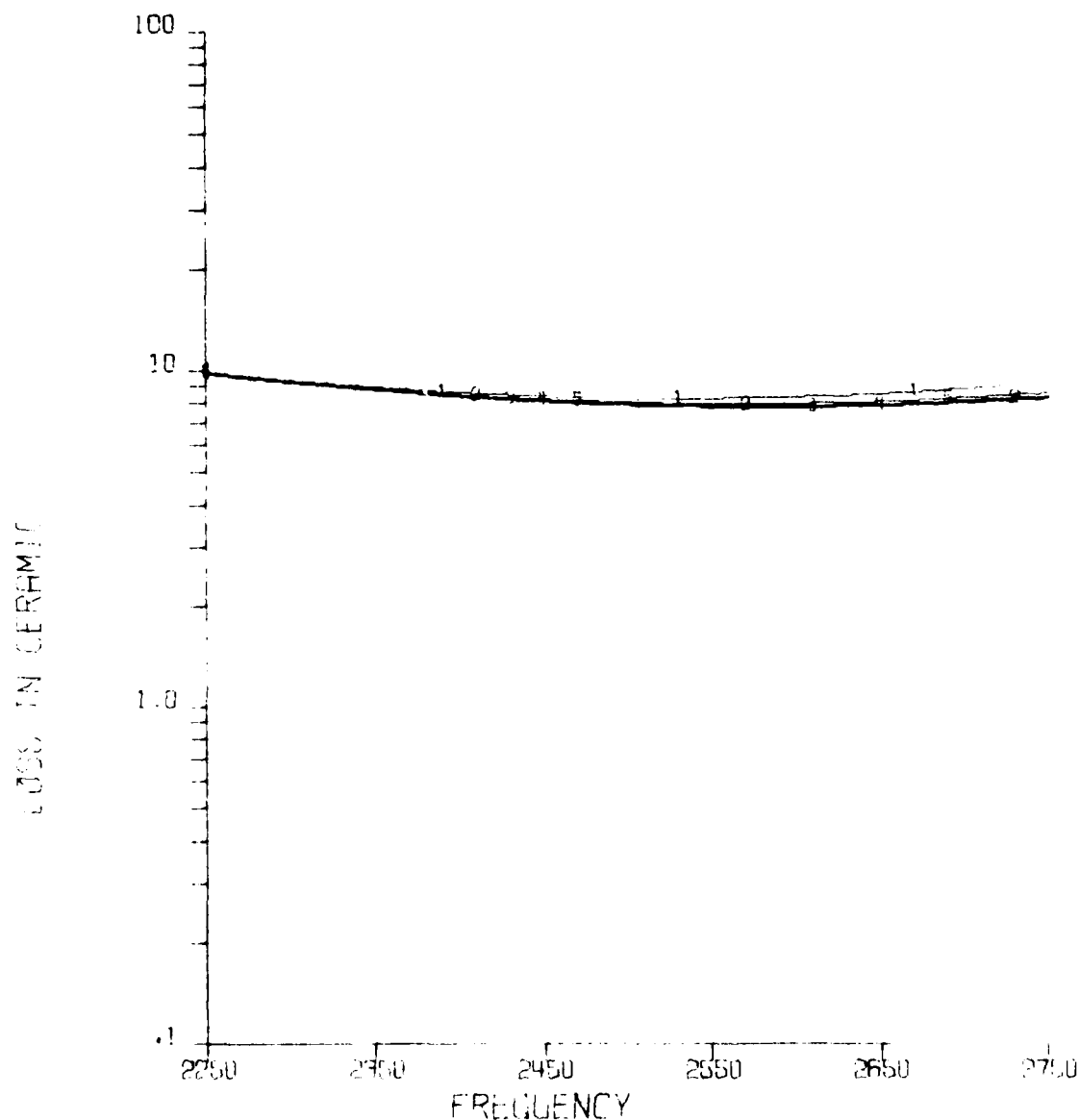
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0,30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =1.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93021119E03

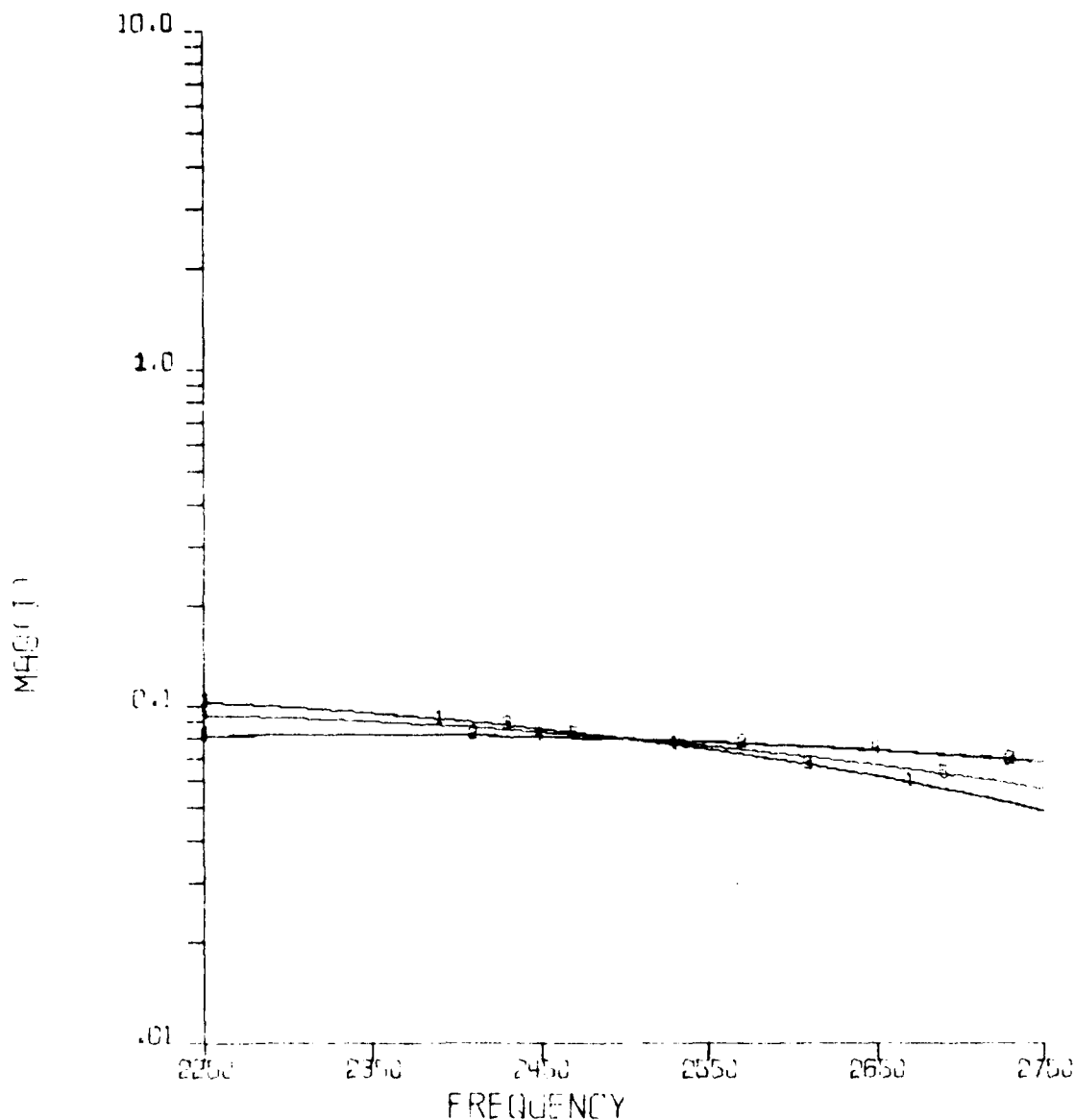
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0,90)
 LP=.3904 GP=E+50 LS=.0000 QS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50861644E03+J7.43469919E03
 CURVE 2 - MAX R =8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411691E03+J1.82753326E03
 CURVE 5 - AVG =6.13526911E03+J3.81425445E03

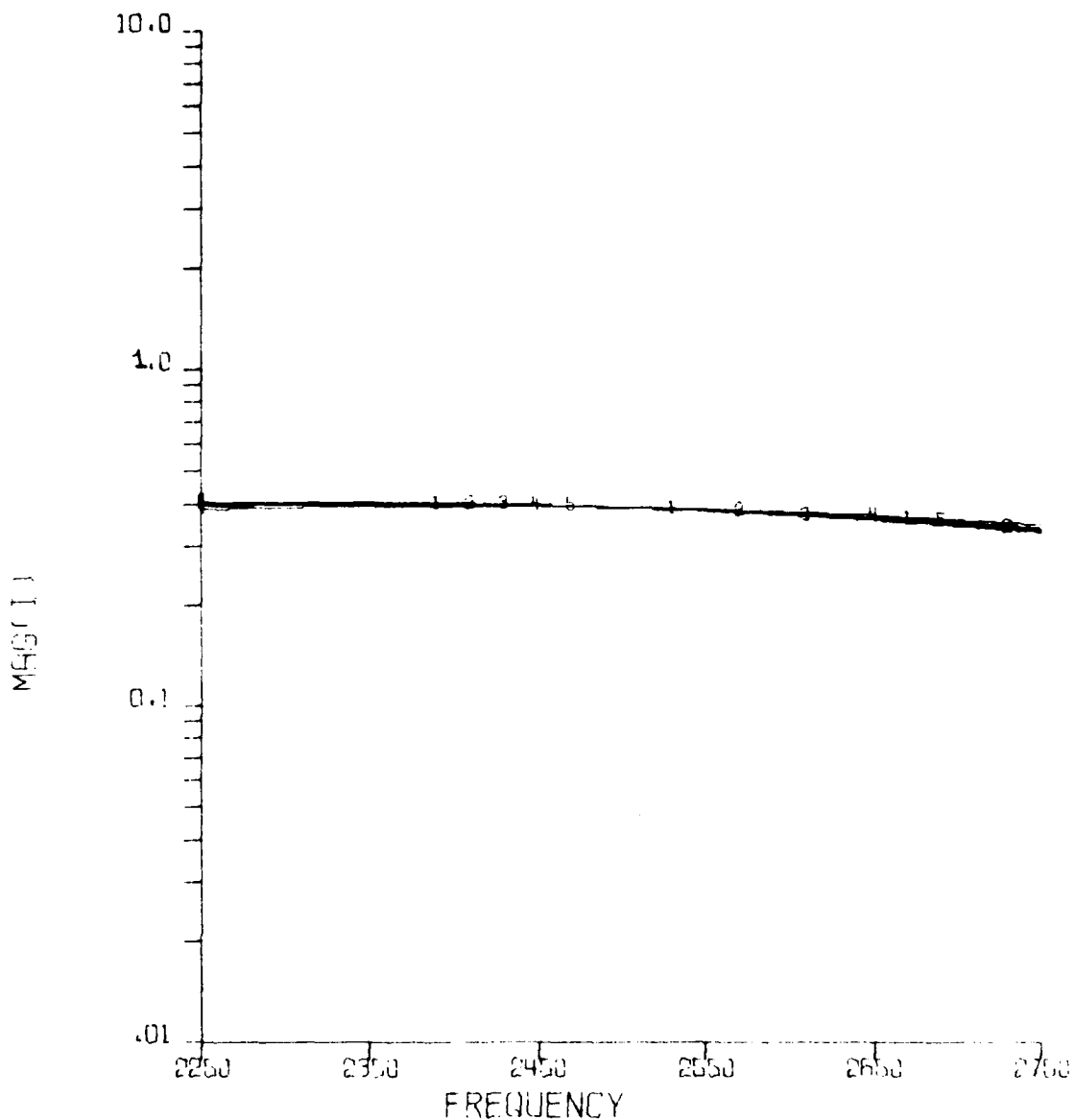
NEL DUMI'OAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(1) VERSUS FREQUENCY

CURVE 1	MAX	PRE	$3.70634046E04 + J7.66828215E04$
CURVE 2	MIN	R	$3.49942781E03 + J7.81806304E03$
CURVE 3	MAX	X	$3.43145191E04 + J7.70014372E04$
CURVE 4	MIN	X	$3.90512498E03 + J6.91990765E03$
CURVE 5	AVG		$3.81596841E04 + J4.83015054E04$

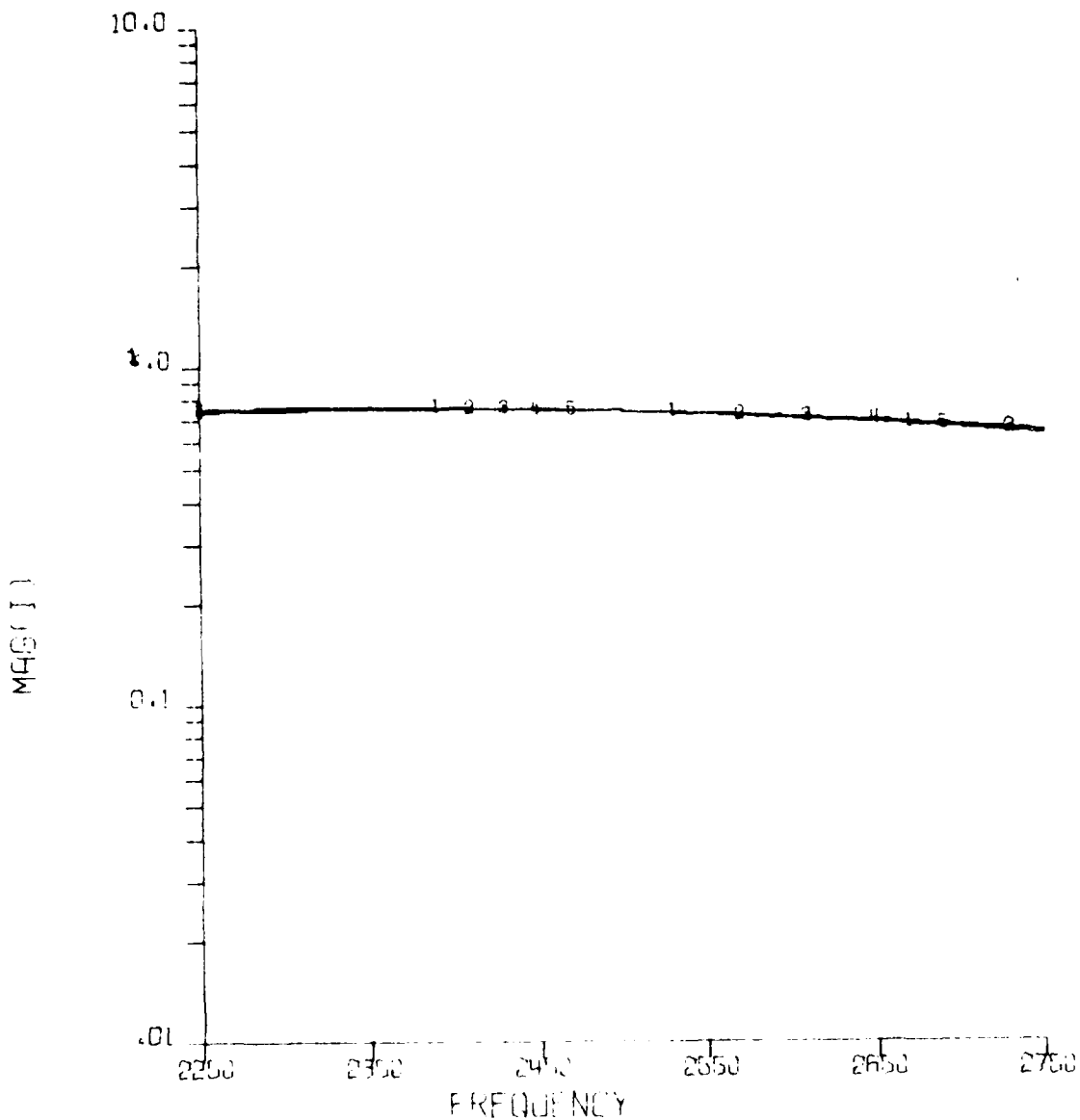
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61947804E04+J0.64038607E00
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E05
 CURVE 3 - MAX X =1.07609438E04+J1.0683E049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

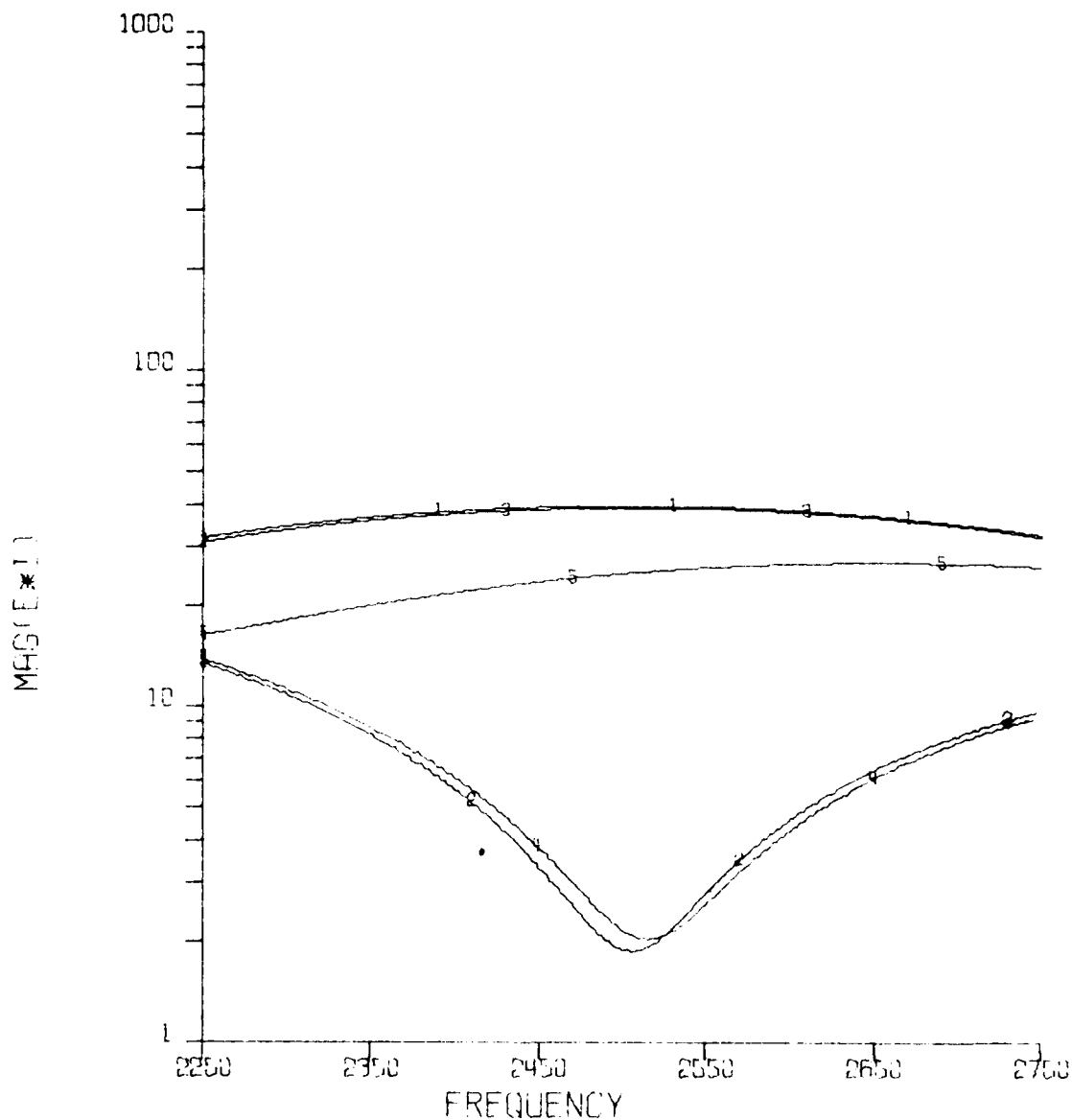
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES 5.50801644E03+J7.43463919E03
 CURVE 2 - MAX R 9.18015967E03+J1.90754574E03
 CURVE 3 - MIN R 4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X 5.94411635E03+J1.82753326E03
 CURVE 5 - AVG 6.13596311E 3+J3.81425445E03

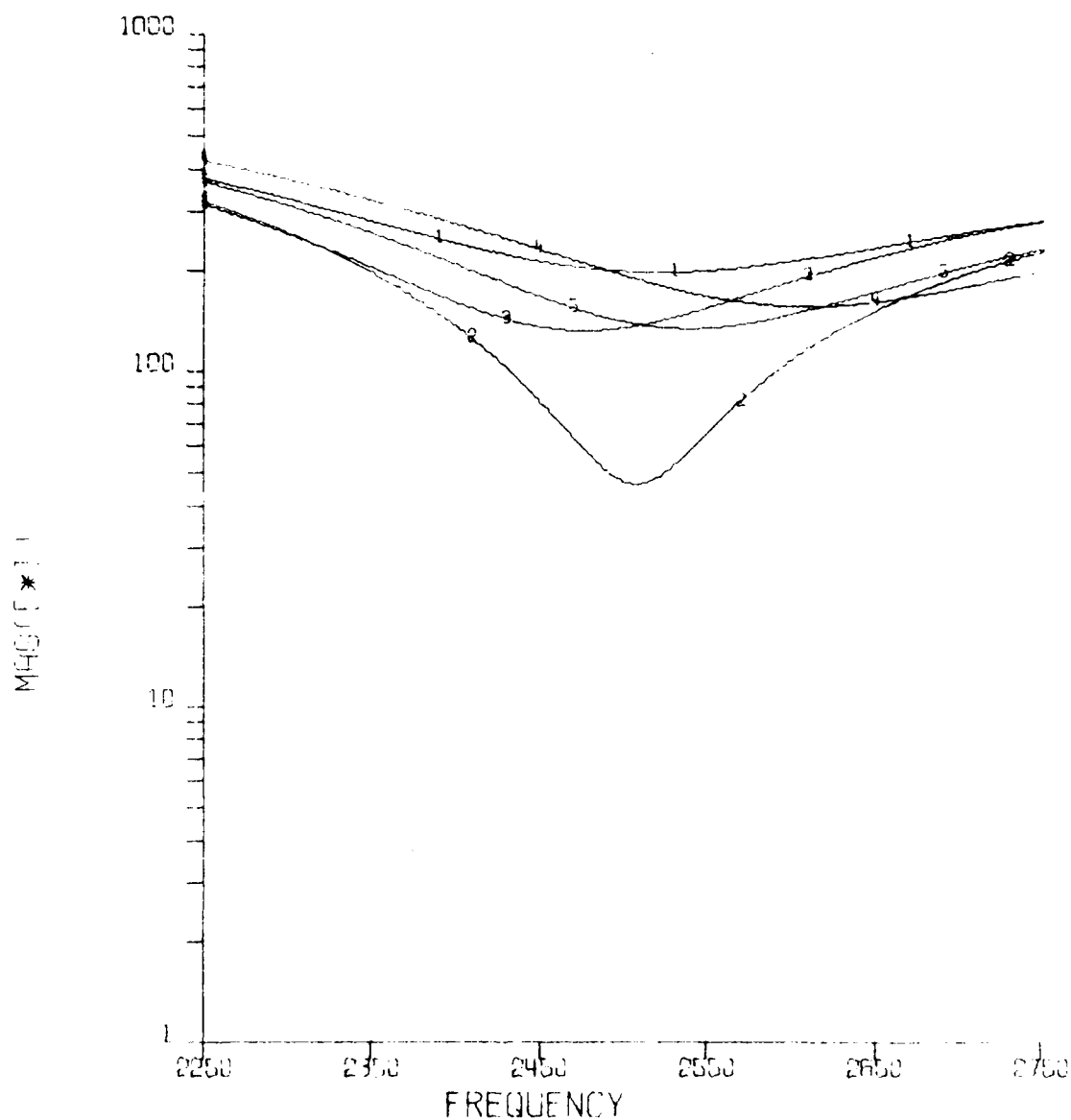
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(E*1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.81990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0,30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50

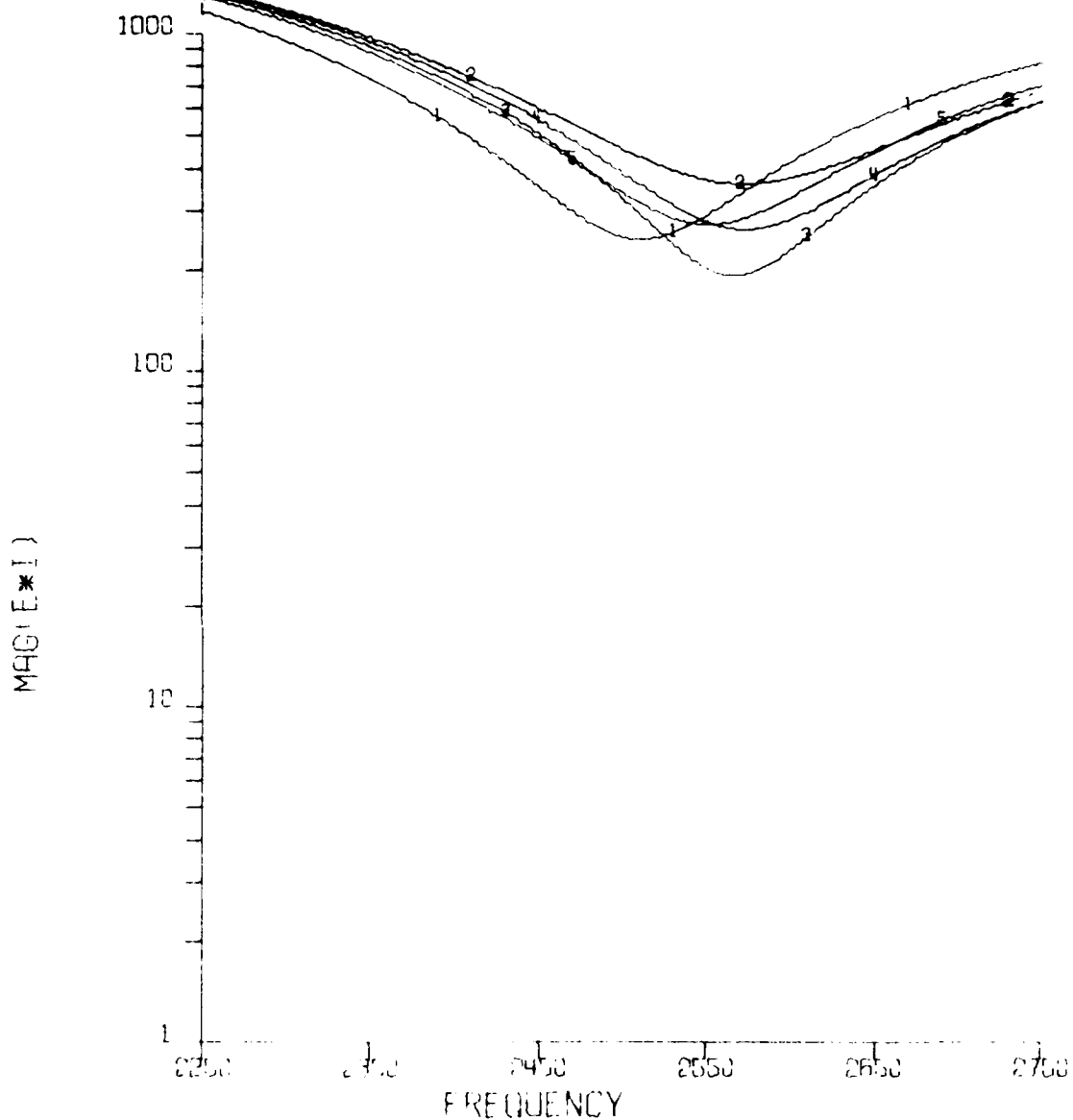


MAG (dB) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61347804E04+J6.64039637E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E05
 CURVE 3 - MAX X =1.07609439E04+J1.06836049E04
 CURVE 4 - MIN X =1.29174594E04 -J9.95386351E02
 CURVE 5 - AVG =1.09353651E04+J4.93E21119E03

NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)

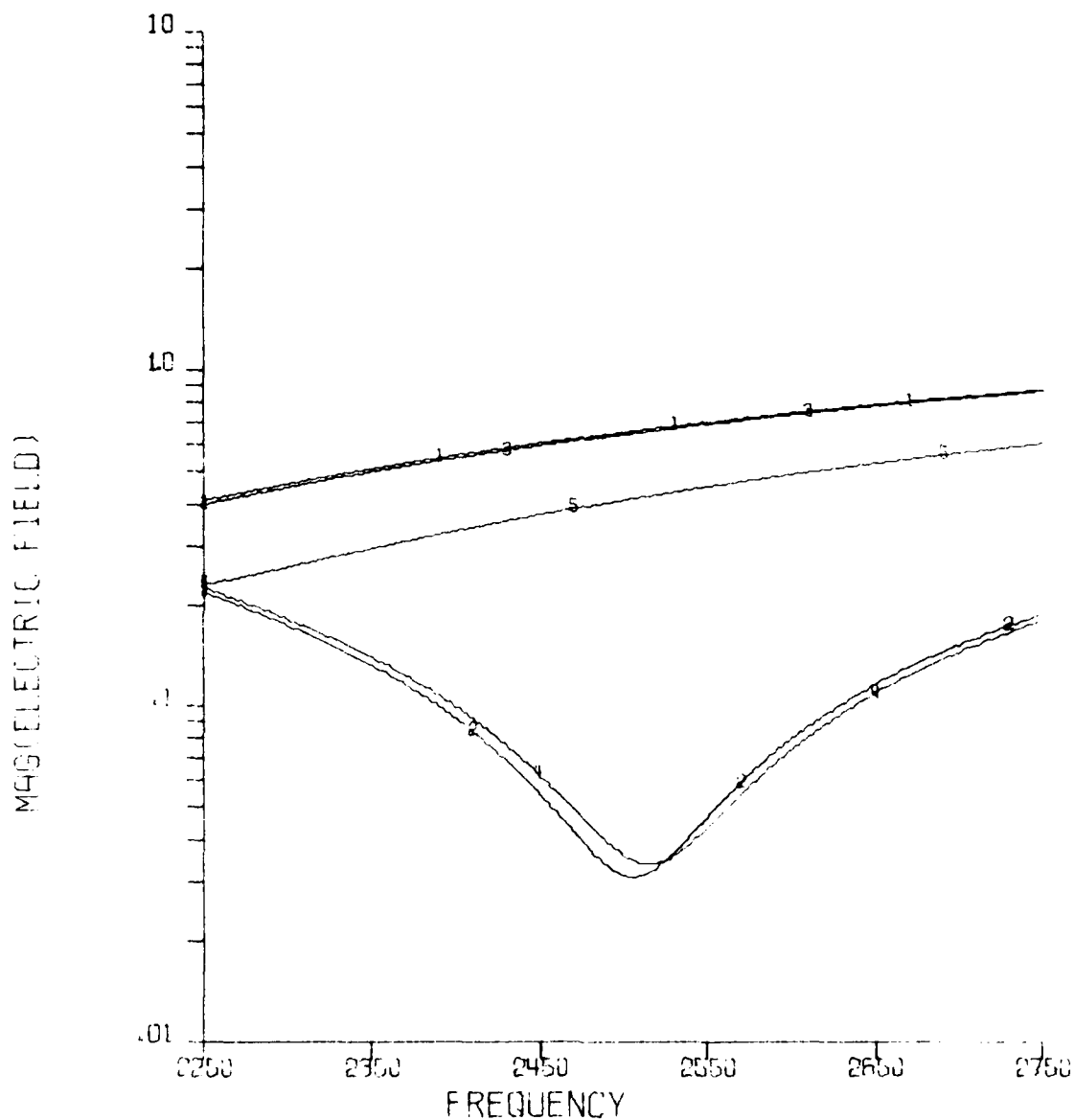
LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAG(E*1) VERSUS FREQUENCY

CURVE 1 - MAX PRES = 5.50801644E03+J7.43460319E03
 CURVE 2 - MAX R = 8.18015967E03+J1.90754574E03
 CURVE 3 - MIN R = 4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X = 5.94411635E03+J1.82753326E03
 CURVE 5 - PVI = 6.13526311E03+J3.81420445E03

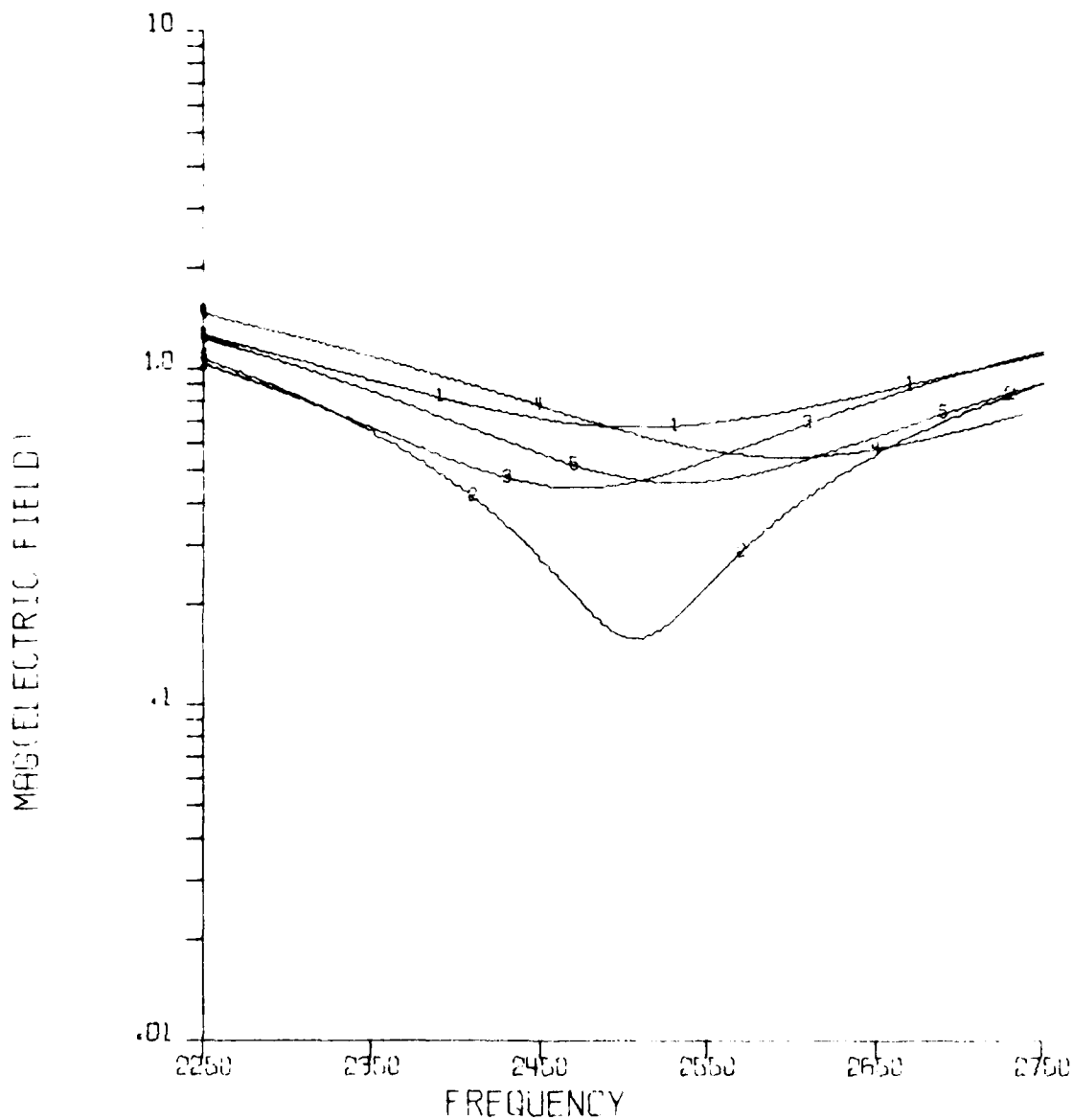
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

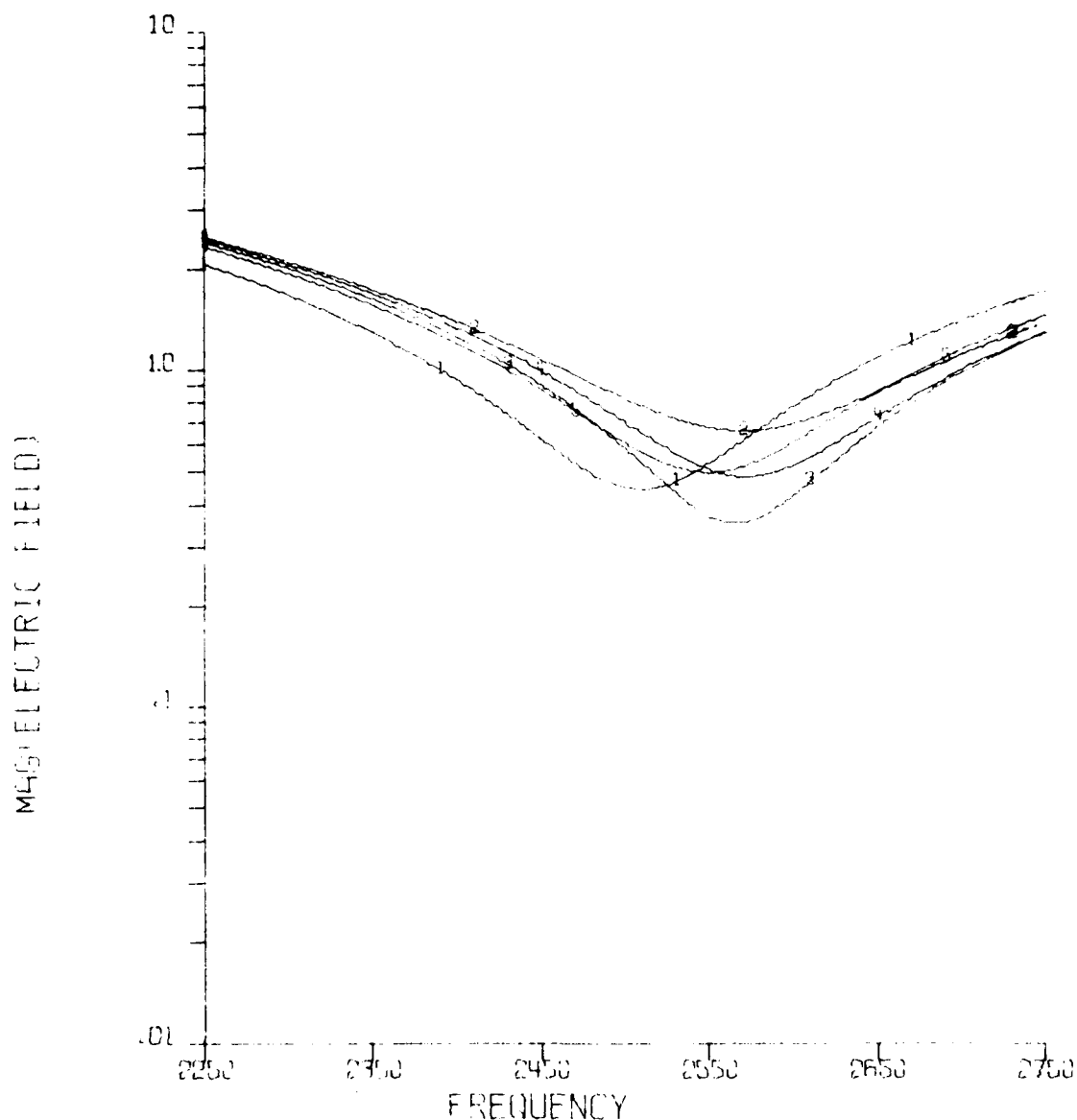
NEL DUMILOAD I
 C.P. 1 5 INCH CTICULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAGNETIC FIELD) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038637E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04 -J9.35386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

NEL DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3904 QP=E+50 LS=.0000 QS=E+50



MAGNETIC FIELD VERSUS FREQUENCY

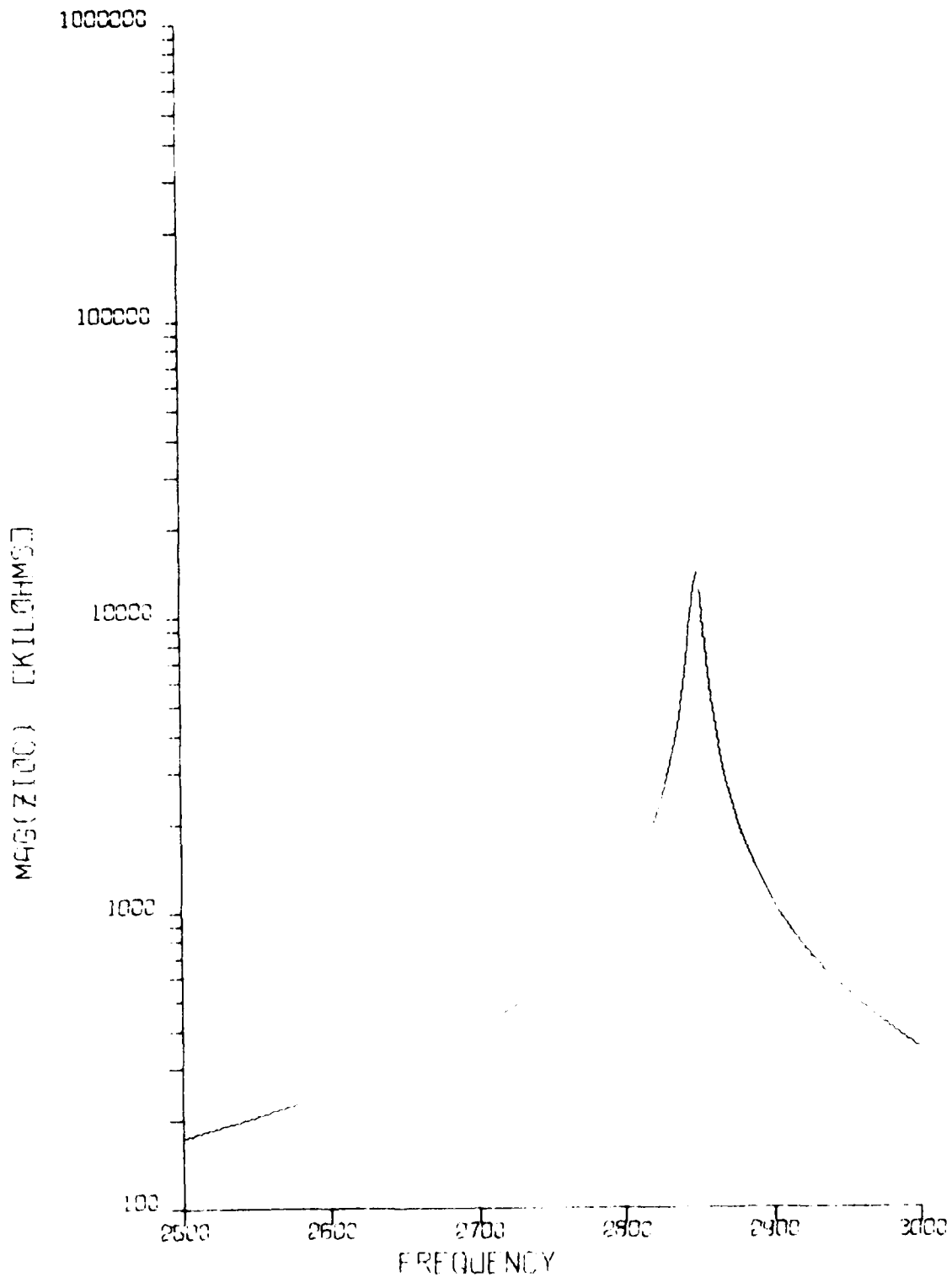
CURVE 1 - MAX PRES = 5.50801644E03+J7.43463919E03
 CURVE 2 - MAX R = 8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R = 4.27951865E03+J2.39239074E03
 CURVE 4 - MIN X = 5.94411635E03+J1.82753326E03
 CURVE 5 - AVG = 6.13526311E03+J3.81426445E03

TRACOR, INC.

HIGH BAND

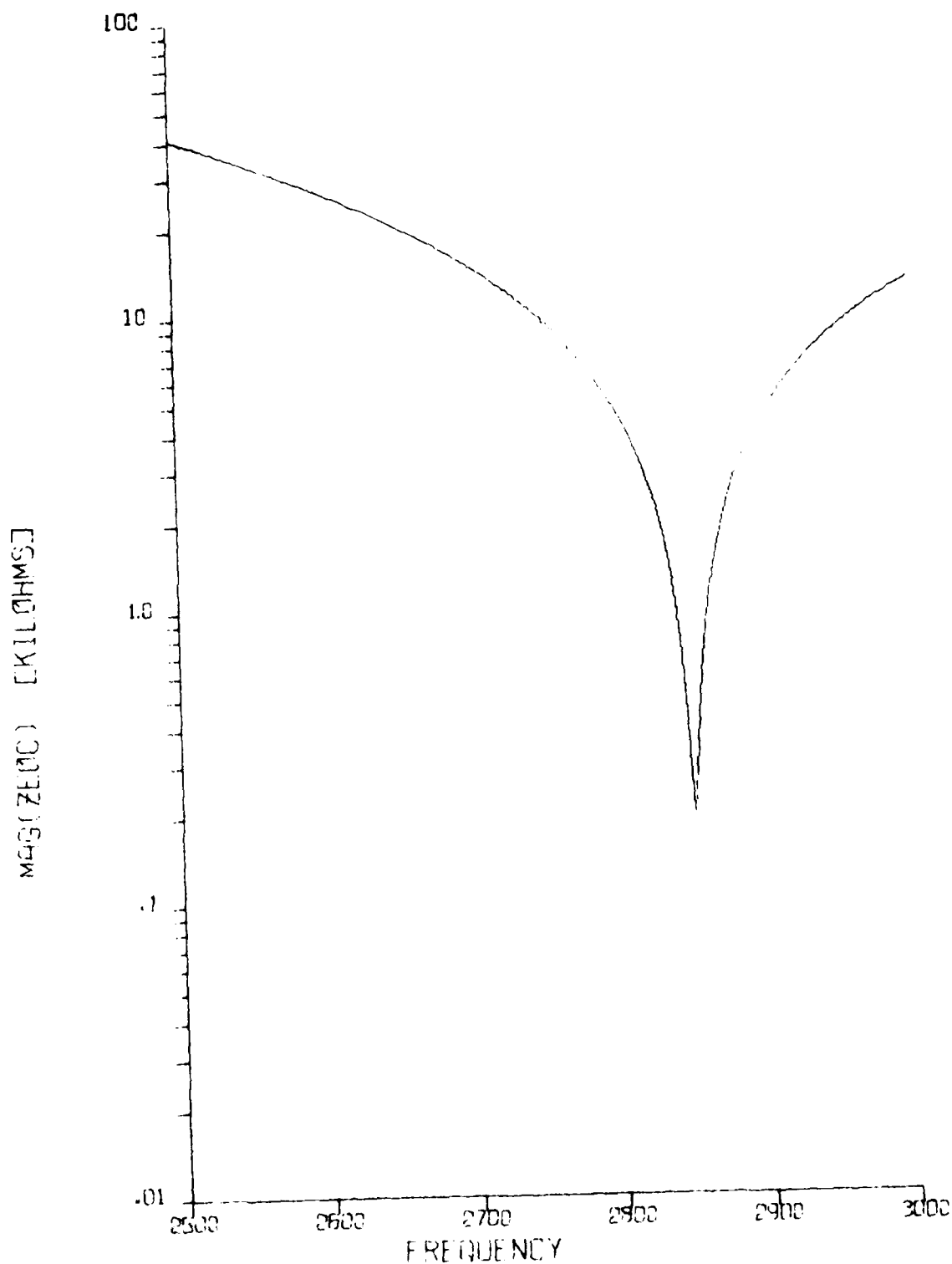
C.P. 1 5 INCH CIRCULAR HEAD
HIGH BAND

LP=.2738 QP=E+50 CS=.2933 DS=0



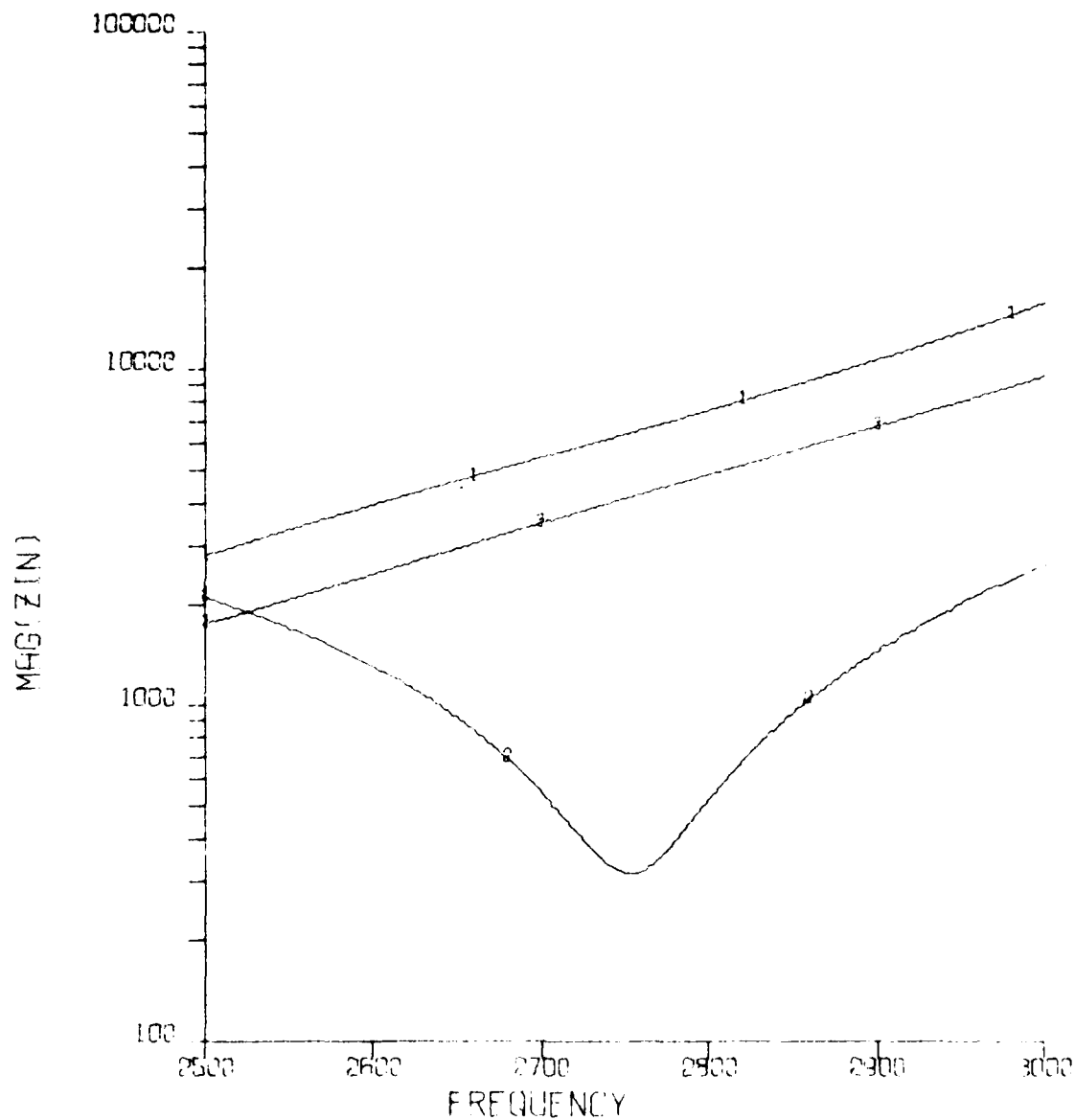
MAG(Z100) VERSUS FREQUENCY

INEL DUMILORD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND
 LP=.2738 QP=E+50 CS=.2933 DS=0



MAG(ZELOC) VERSUS FREQUENCY

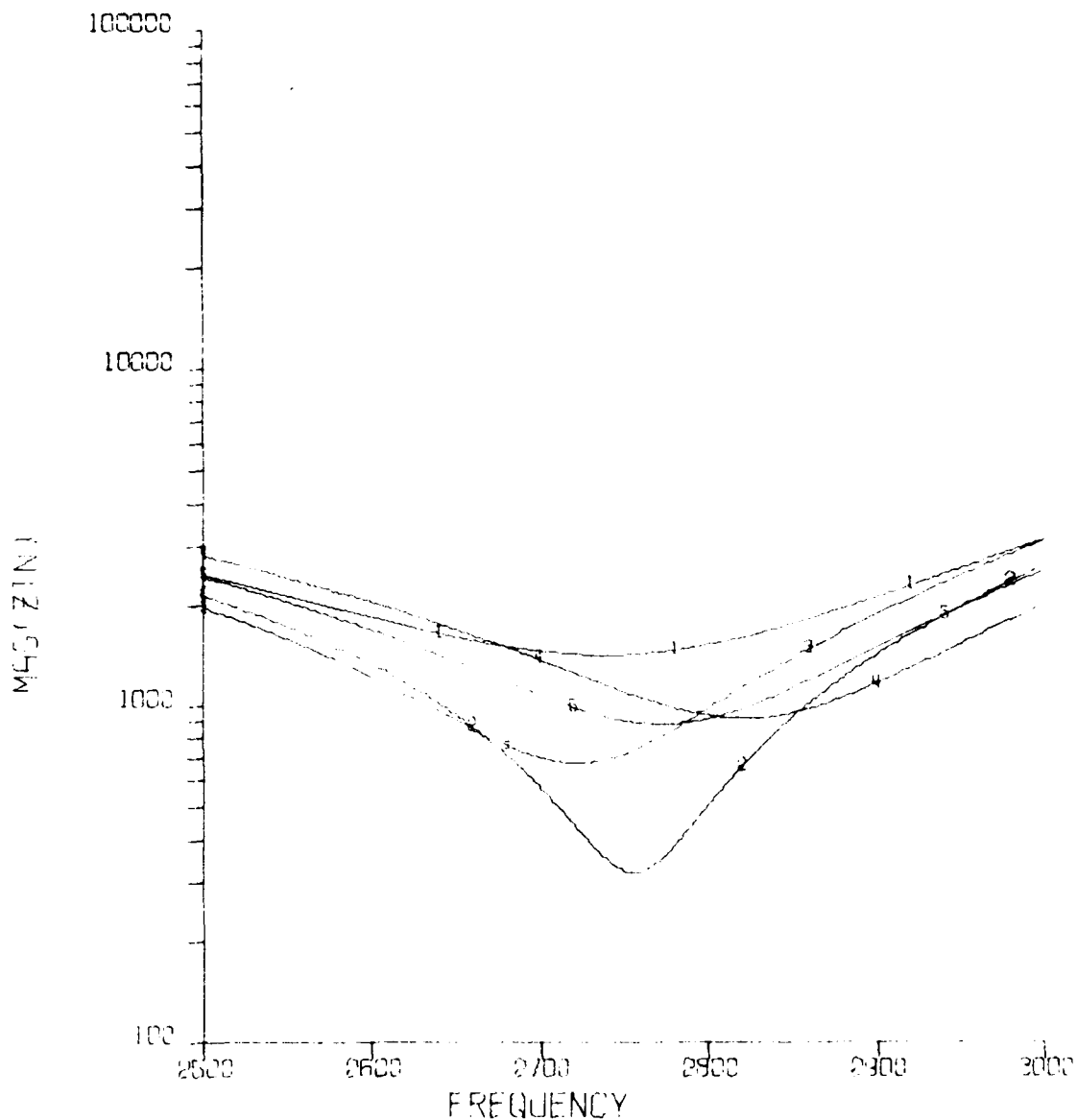
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.45303975E04
 CURVE 2 - MIN R =3.50169917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.75781665E04

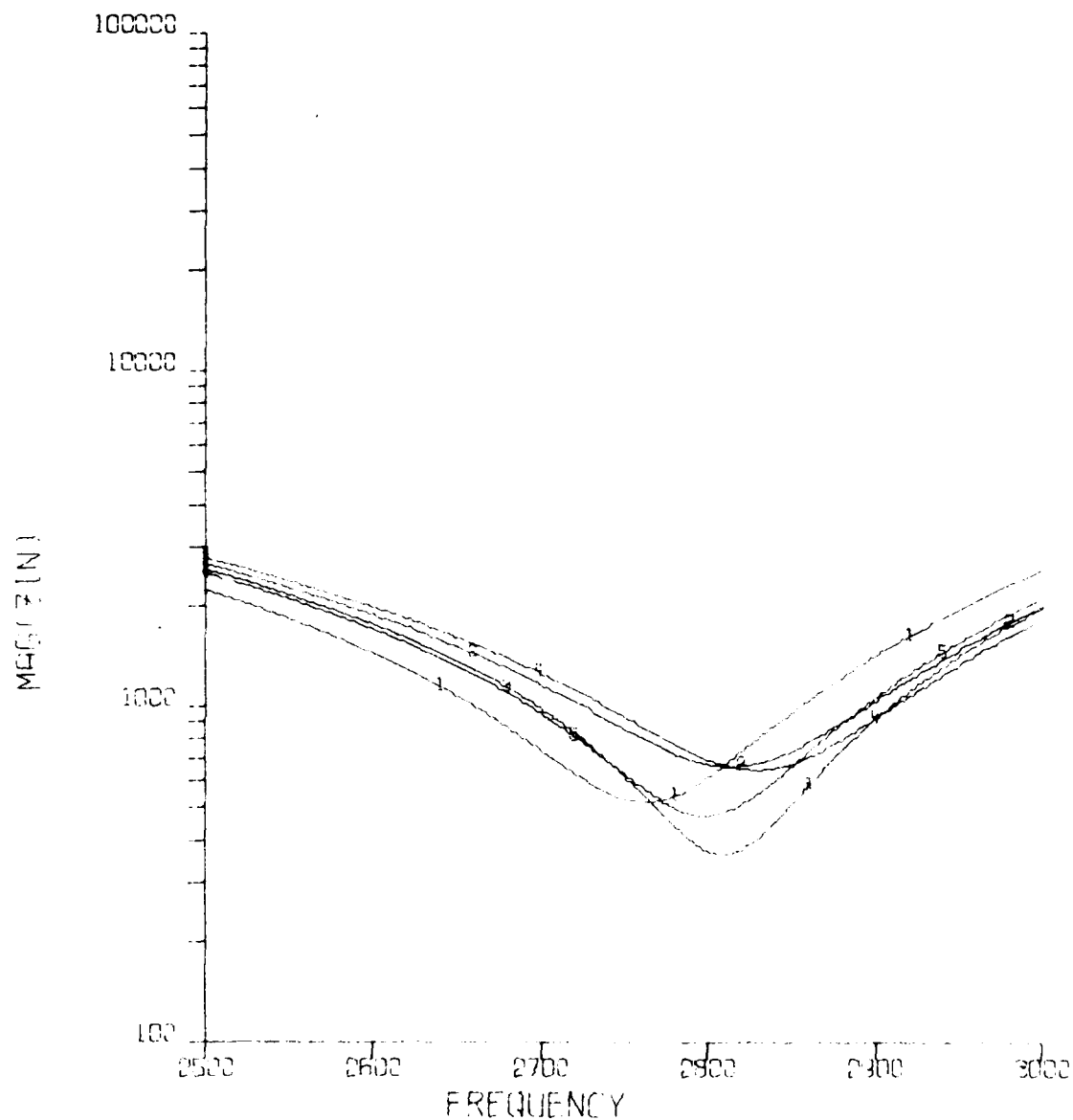
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10089048E03
 CURVE 2 - MIN R =3.53974880E03+J9.01288799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =3.73845096E03+J1.52307533E03
 CURVE 5 - AVG =3.89594457E03+J6.39905526E03

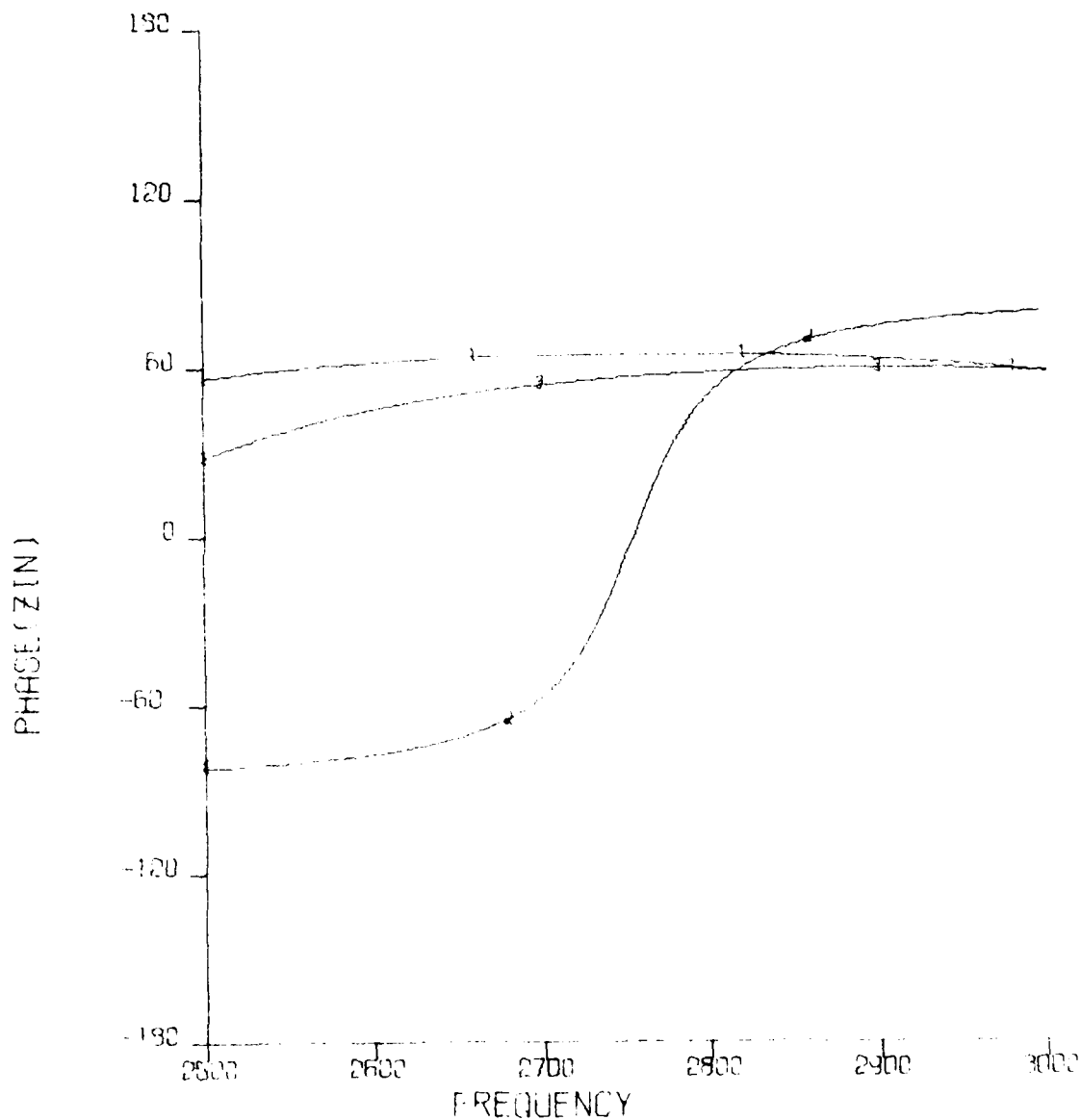
NEL DUMLOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.93226749E03+J9.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.73985796E03
 CURVE 3 - MIN R =3.79636591E03+J3.64526485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41093003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678378E03

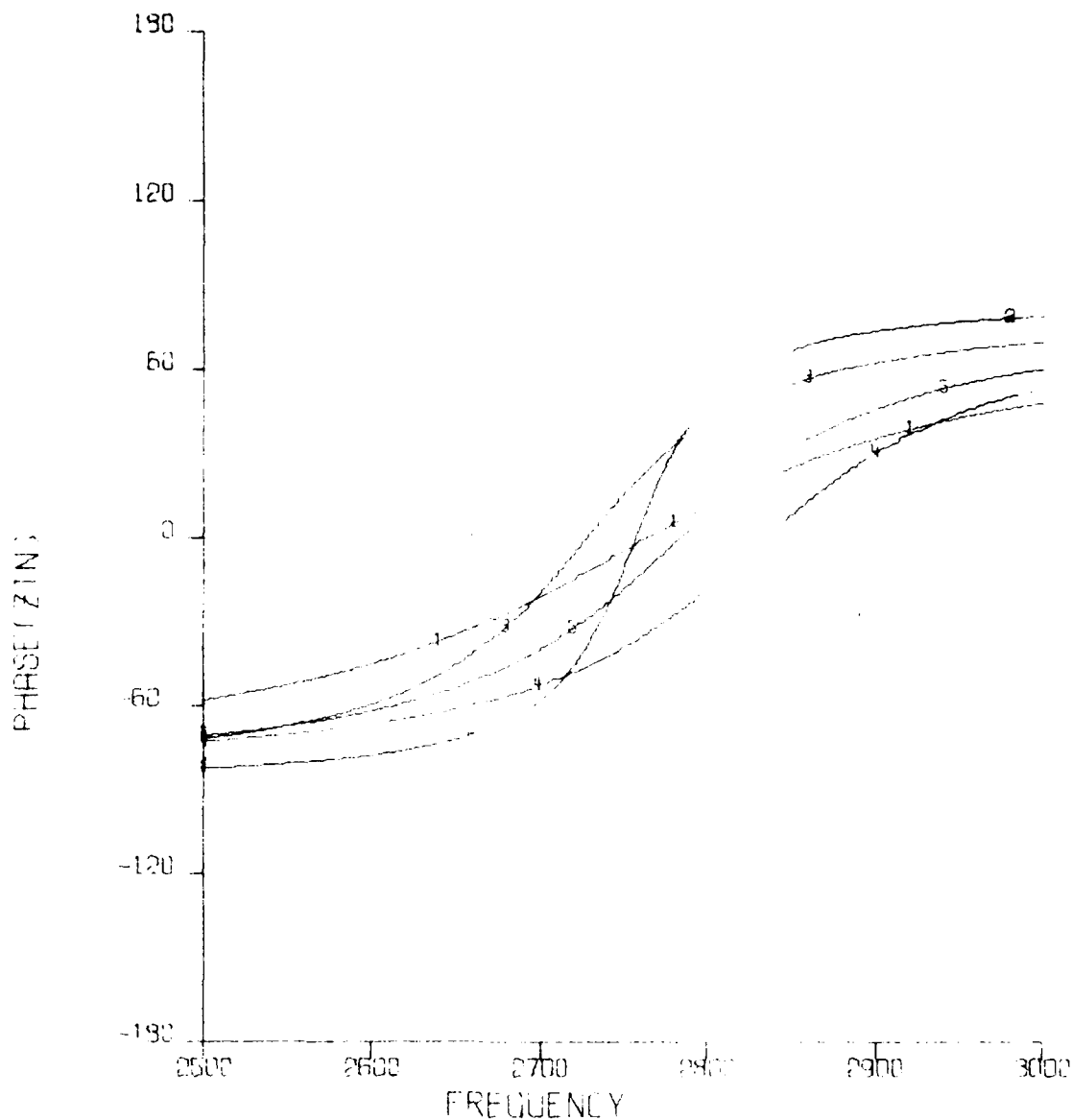
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.49303970E04
 CURVE 2 - MIN R =3.50169917E03+J9.28735195E03
 CURVE 3 - AVG =3.05065992E04+J5.25781666E04

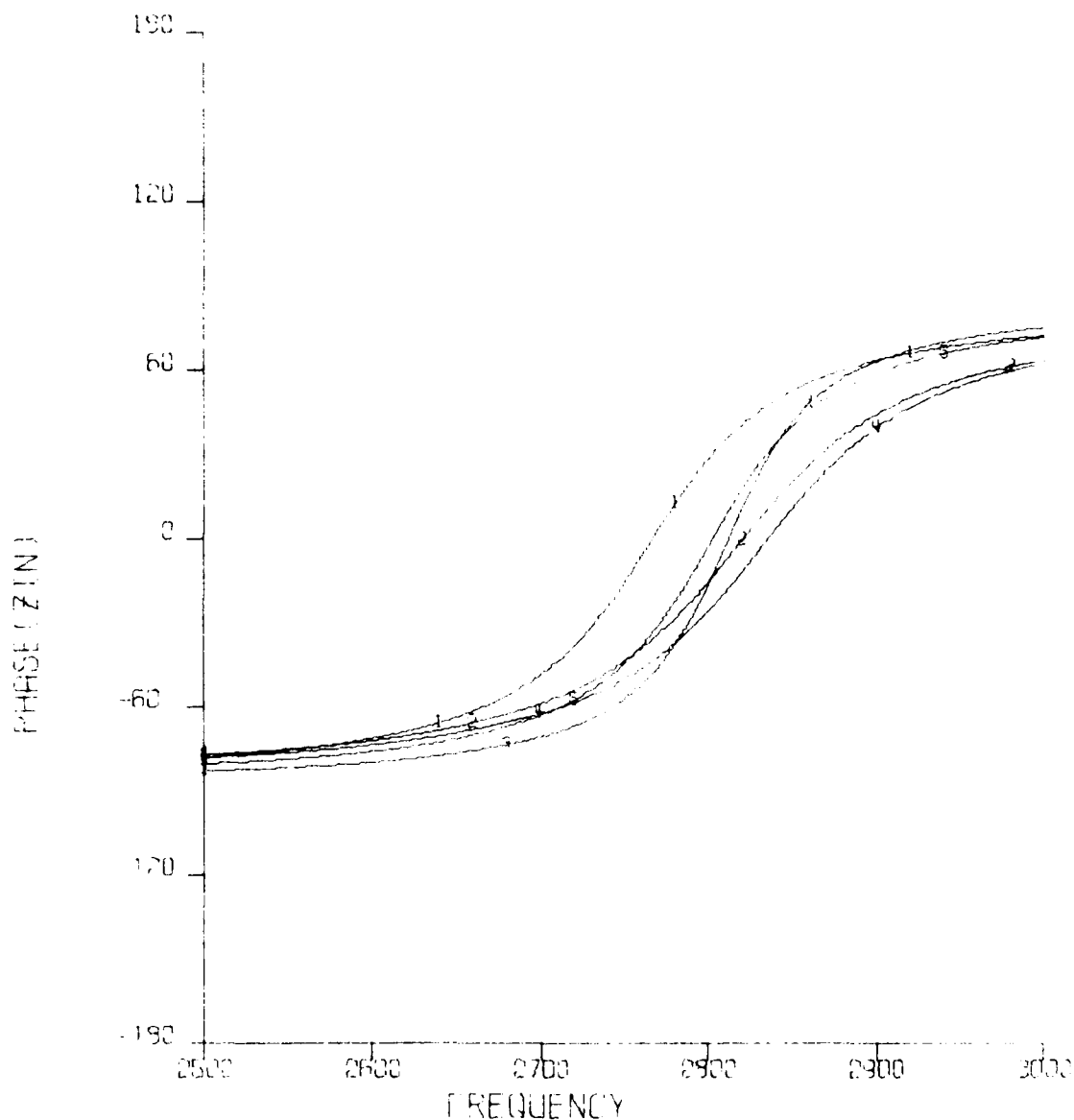
NEL DUMILOAD
 C.P. 1 5 INCH CIRC HEAD
 HIGH BAND 30 DEGRE .30)
 LP=.2738 QP=E+50 CS=.2 JS= 0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.653022811E+15 .10088048E03
 CURVE 2 - MIN R =3.538748901E+19 .01288799E03
 CURVE 3 - MAX X =8.44770071E+11 .12061760E04
 CURVE 4 - MIN X =9.7394509E+10 .15230753E03
 CURVE 5 - AVG =3.395044E+11 .3673890552E03

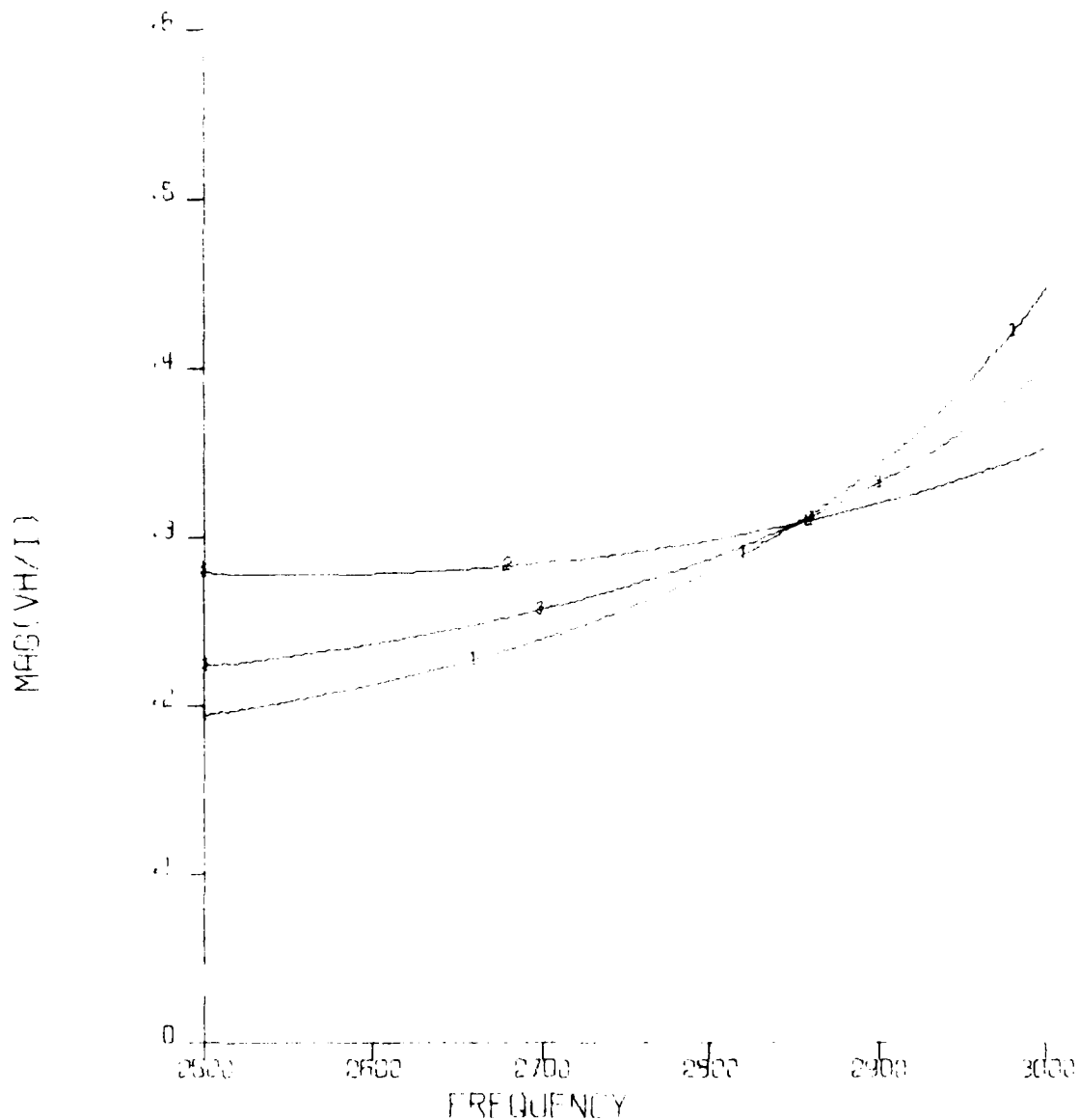
NEL DUMILORD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=2738 QP=460 CS=-2933 DS= 0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1	MAX PRES	$5.83226748E03 + J3.12301916E03$
CURVE 2	MAX R	$-7.04807449E03 + J2.79985796E03$
CURVE 3	MIN R	$-3.78638591E03 + J3.64525485E03$
CURVE 4	MIN X	$-6.77634102E03 + J1.41053003E03$
CURVE 5	AVG	$5.07852123E03 + J4.58678978E03$

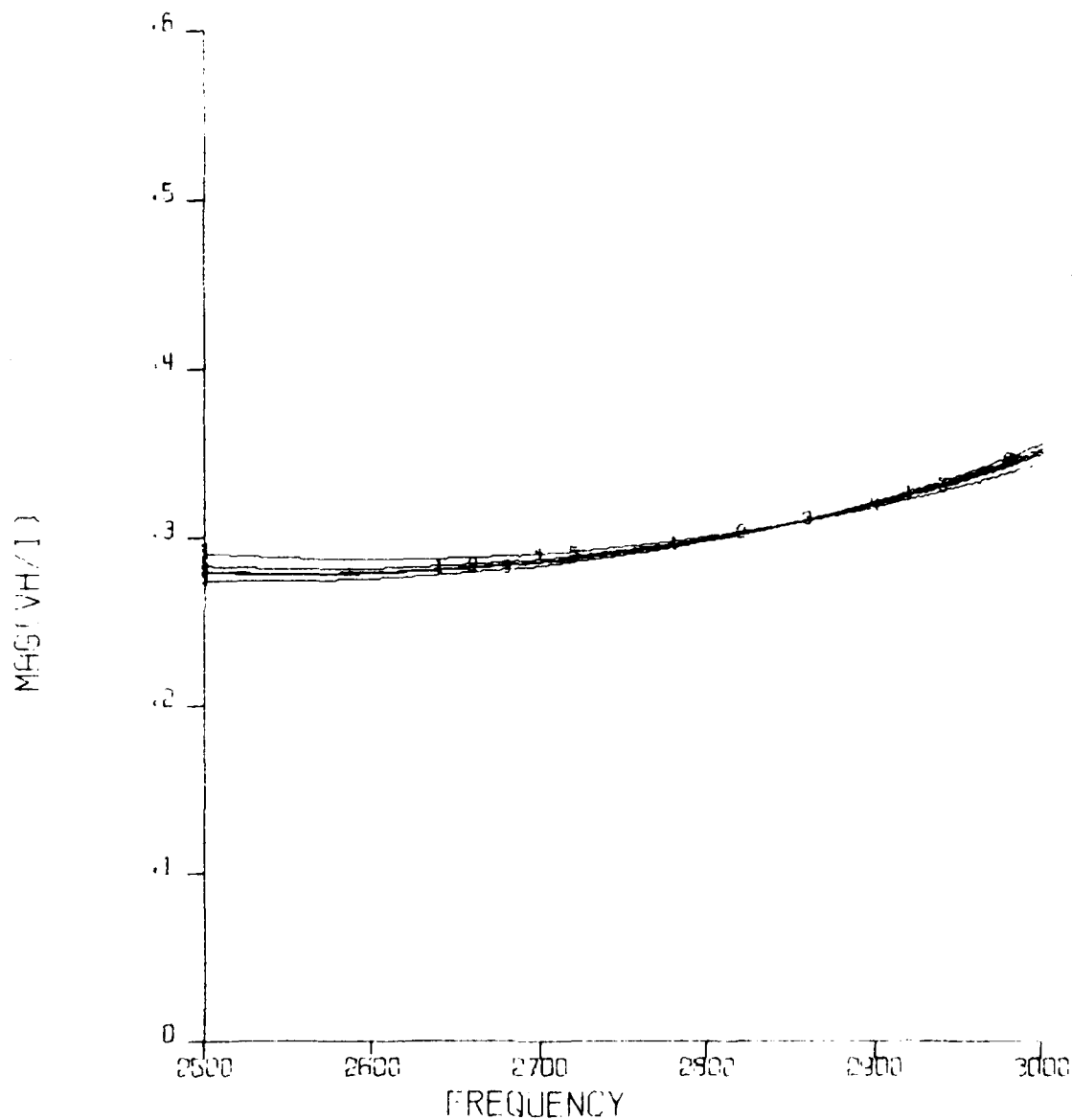
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PREC 4.703970761E 04 + J5.49305975E 04
 CURVE 2 - MIN R 3.50169917E 03 + J9.29735199E 03
 CURVE 3 - AVE 3.095065492E 04 + J5.25791665E 04

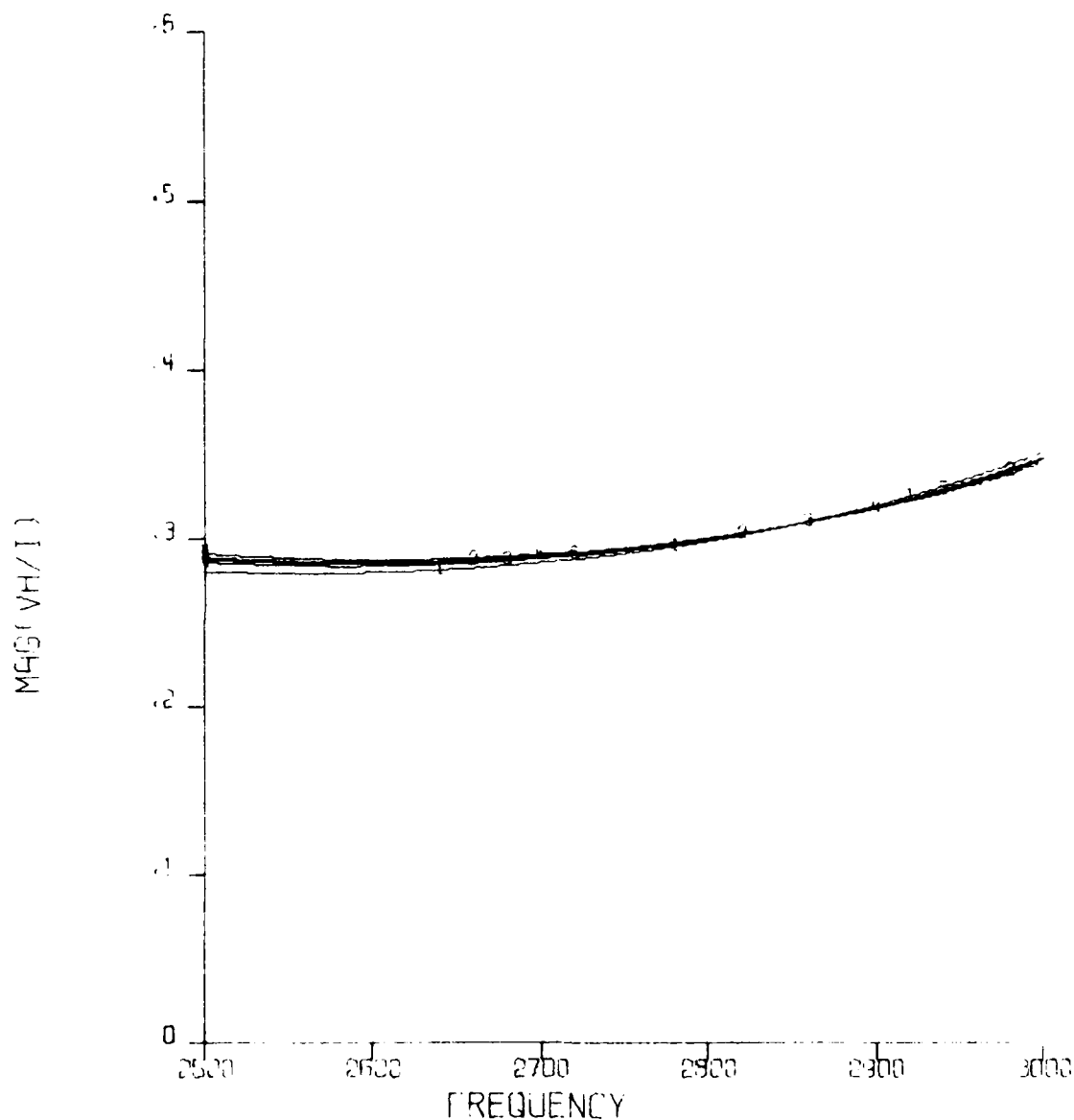
NF=1000
 C.F. 1 1/2 INCH CIRCULAR HORN
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 DS=



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10038048E03
 CURVE 2 - MIN R =3.53874880E03+J9.01298799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73845088E03+J1.52307533E03
 CURVE 5 - AVG =9.89594457E03+J6.38905526E03

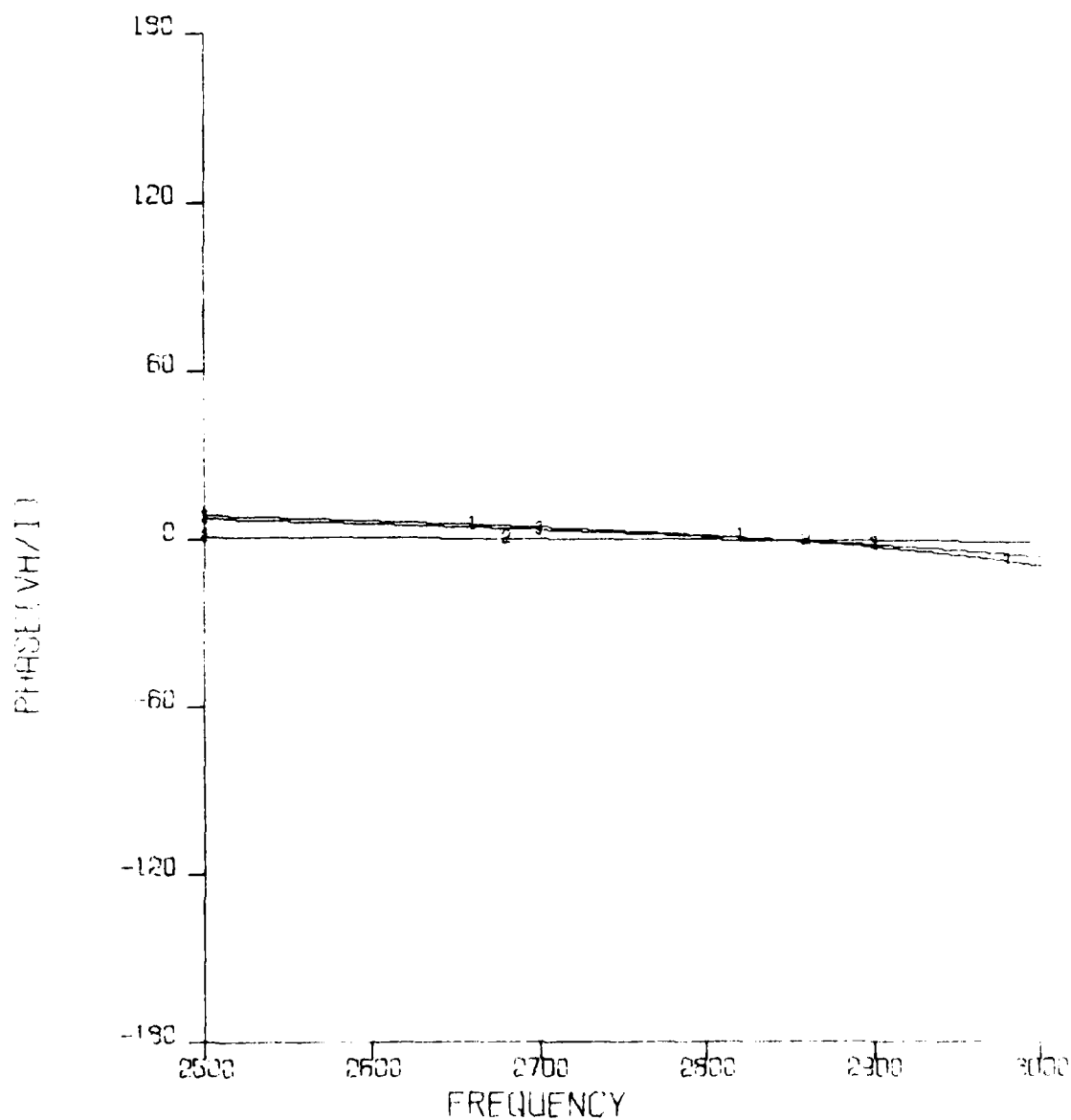
C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 OP=E+50 CS=.2333 DS= 0



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79989788E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525489E03
 CURVE 4 - MIN X =6.77634102E03+J1.41093003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

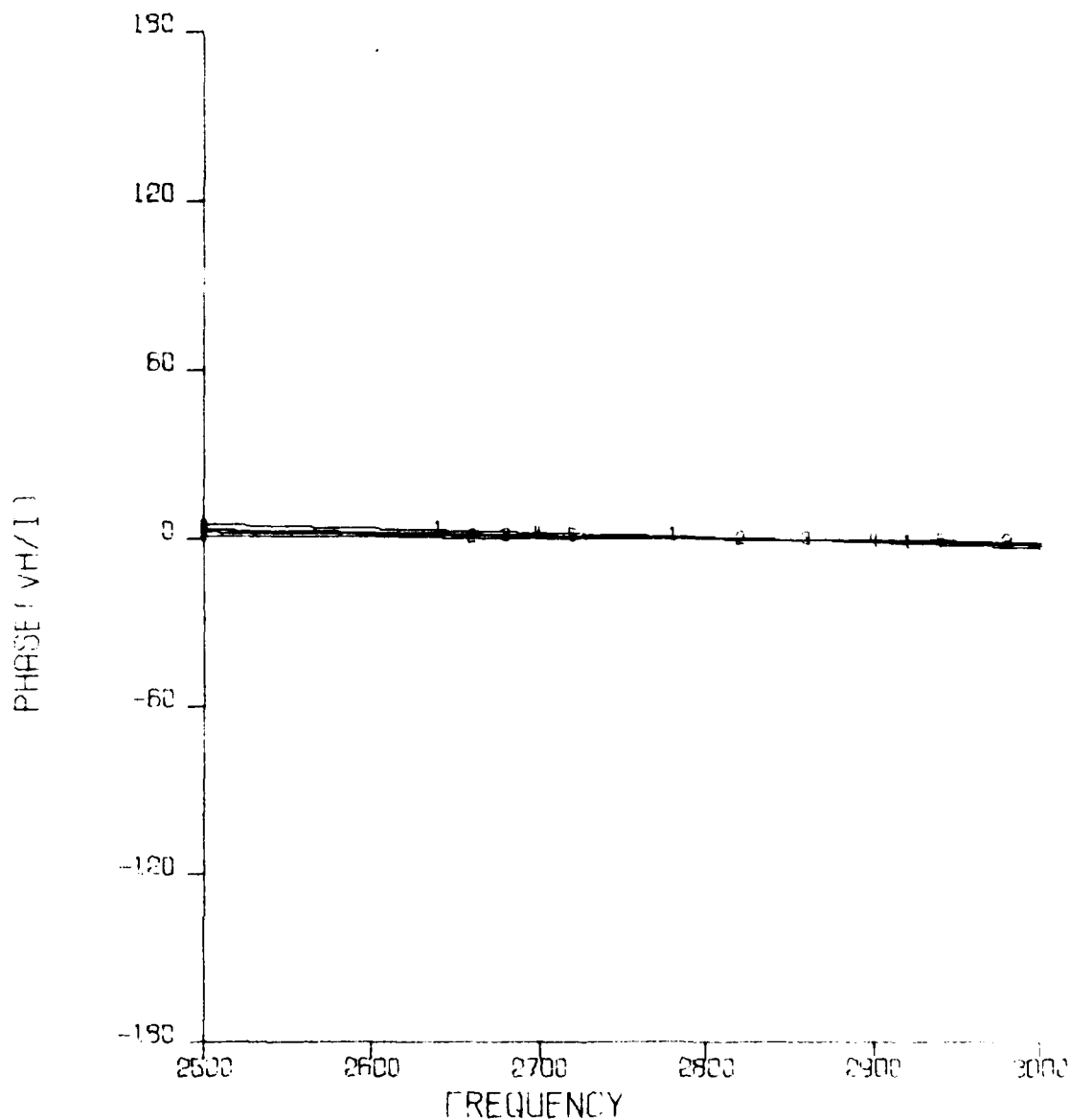
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX $4.03970761E04 + J8.48303975E04$
 CURVE 2 - MIN R $3.50168917E03 + J9.28735198E03$
 CURVE 3 - AVG $3.05065392E04 + J5.75781665E04$

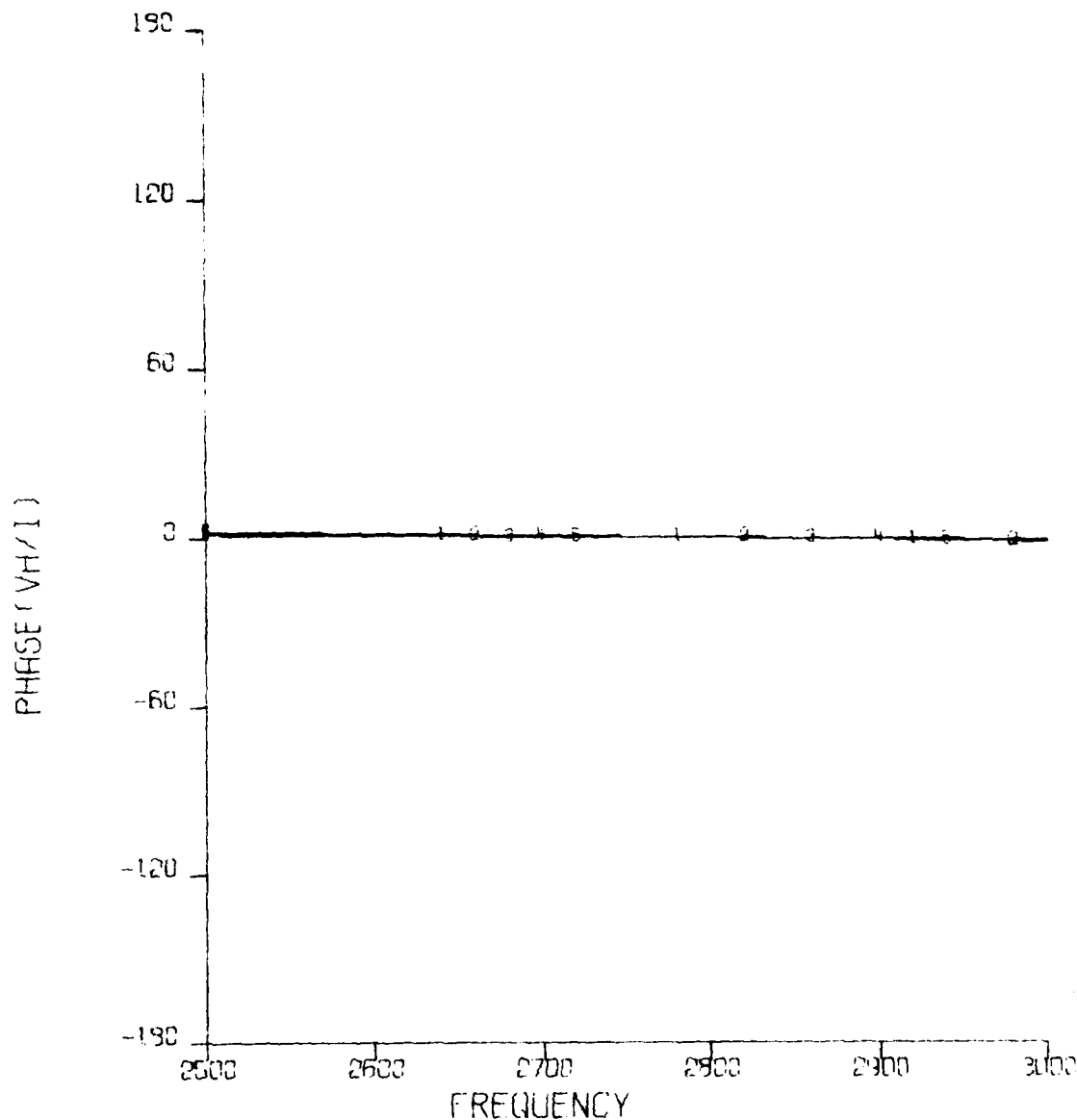
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 - MIN R 3.53874380E03+J9.01288799E03
 CURVE 3 - MAX X 8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X 8.77945098E03+J1.52307533E03
 CURVE 5 - AVG 8.89594457E03+J6.39905506E03

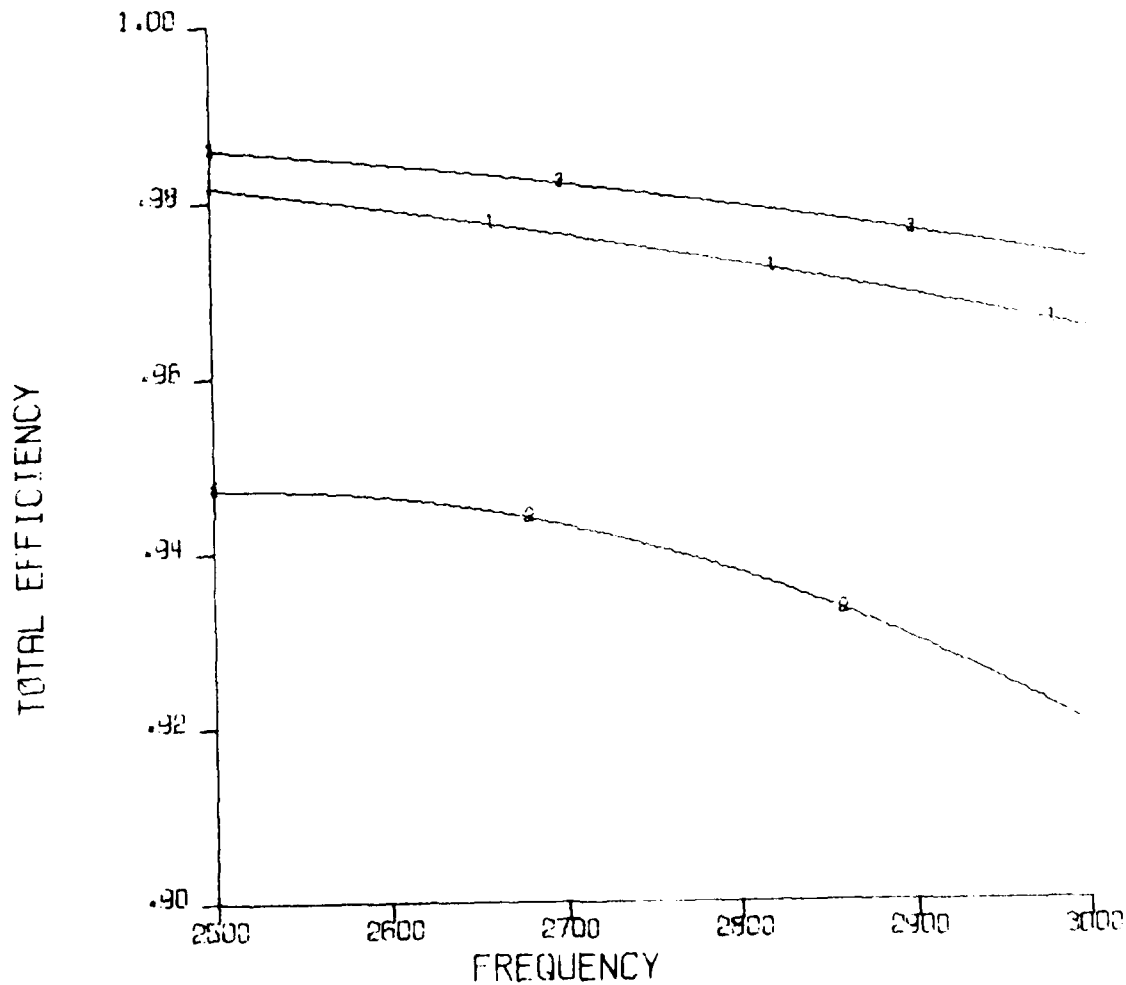
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301918E03
 CURVE 2 - MAX R =7.04907449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

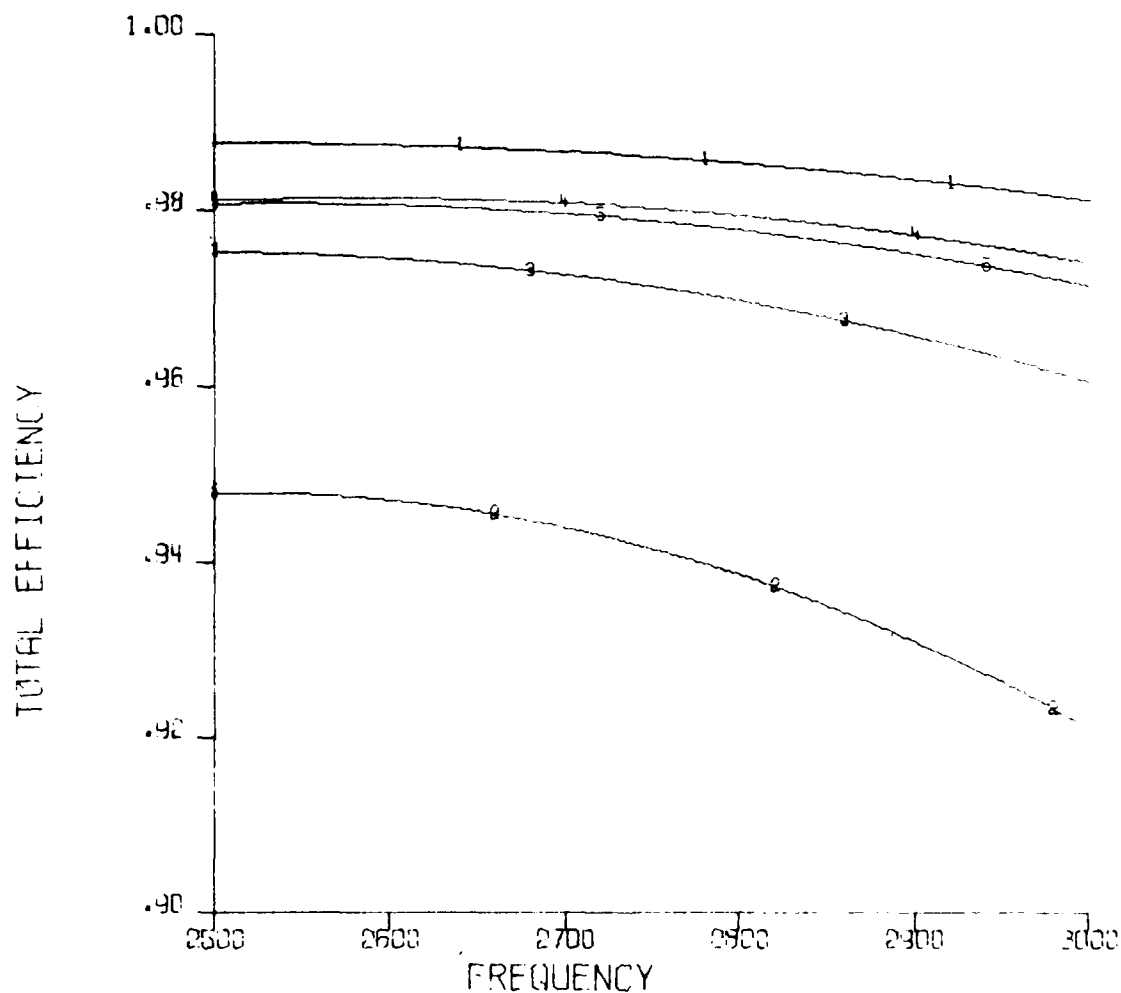
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065492E04+J5.25781665E04

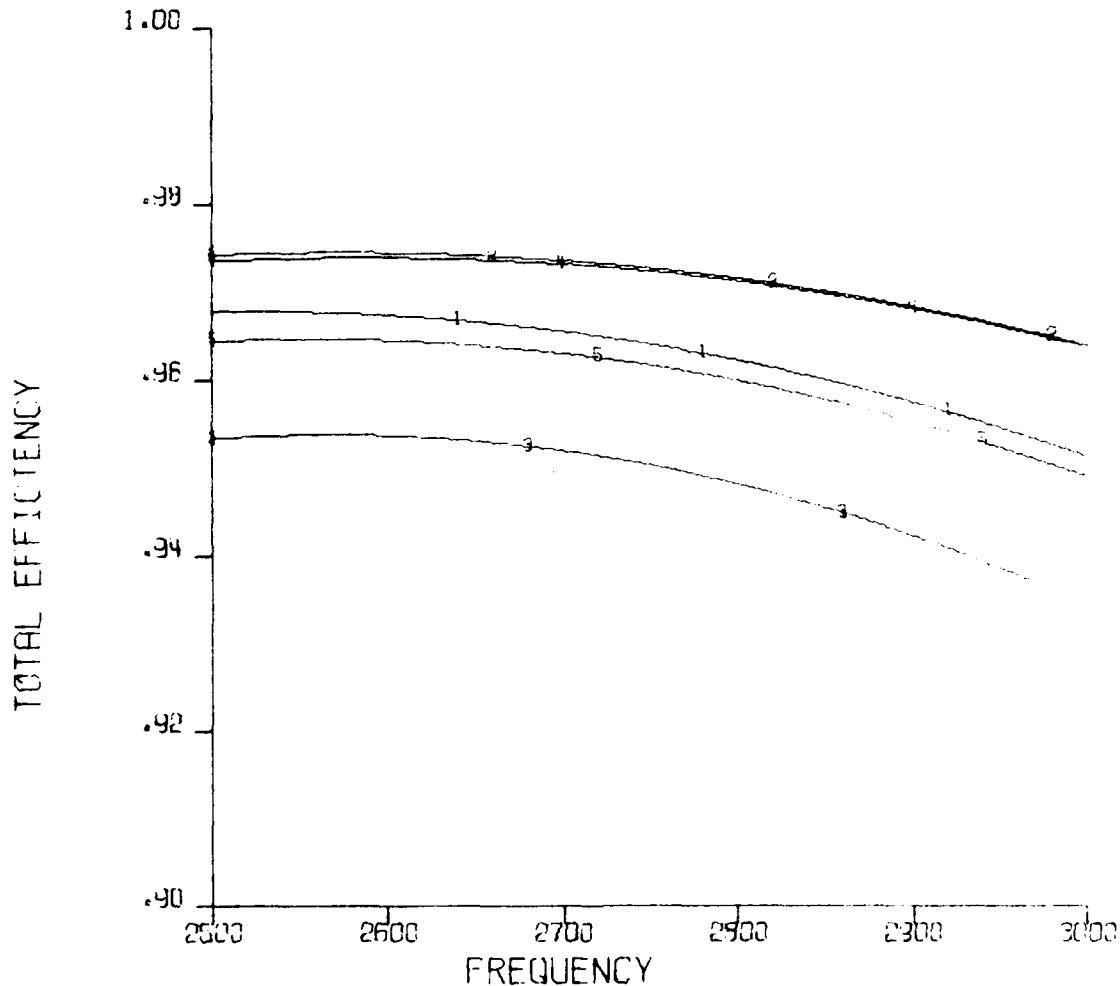
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 PS= 0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 - MIN R =3.53974880E03+J9.01288799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73845096E03+J1.52307533E03
 CURVE 5 - AVG =9.89594457E03+J6.38905526E03

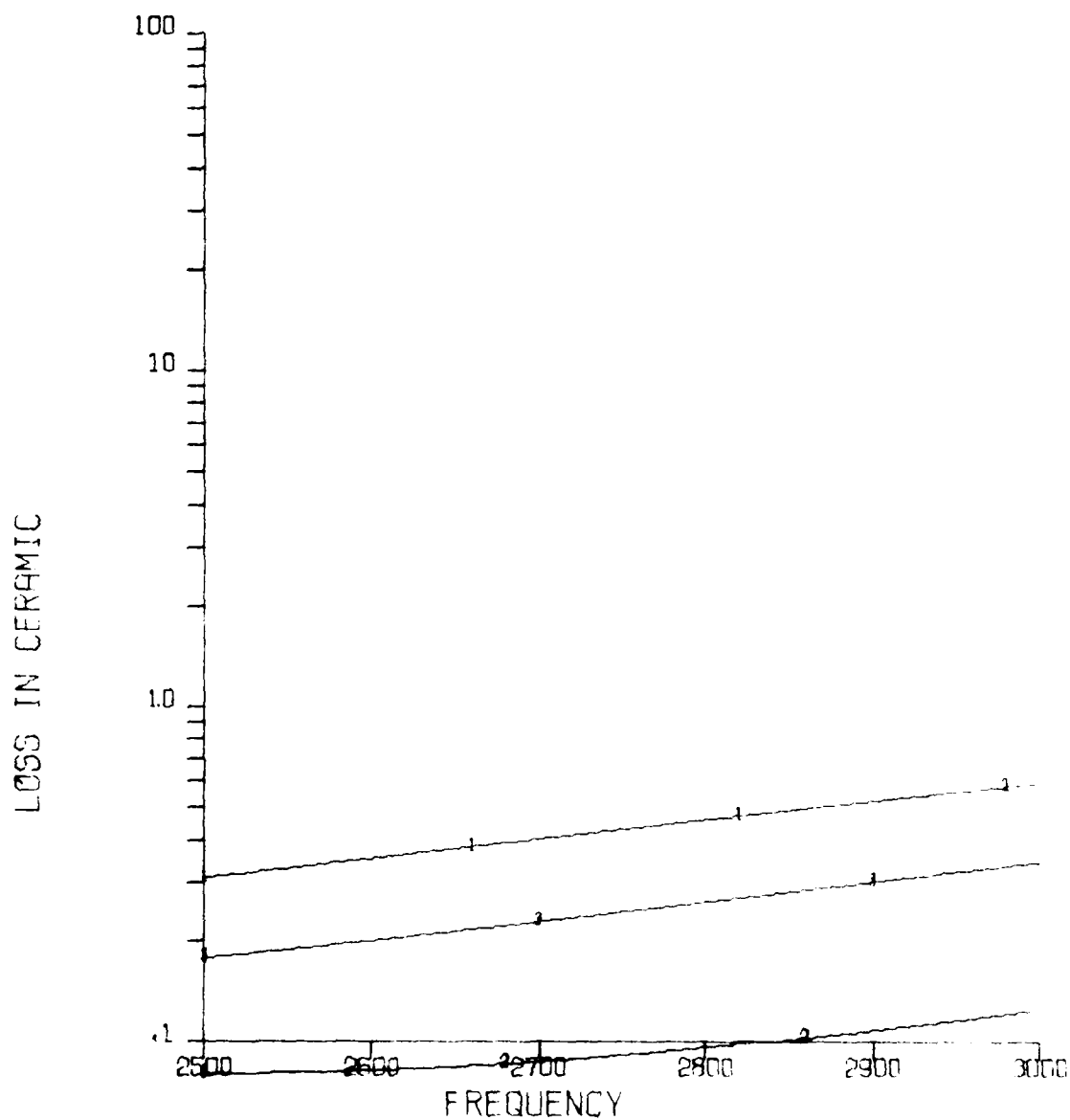
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79935796E03
 CURVE 3 - MIN R =3.78E36591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41080003E03
 CURVE 5 - AVG =5.07857123E03+J4.59679978E03

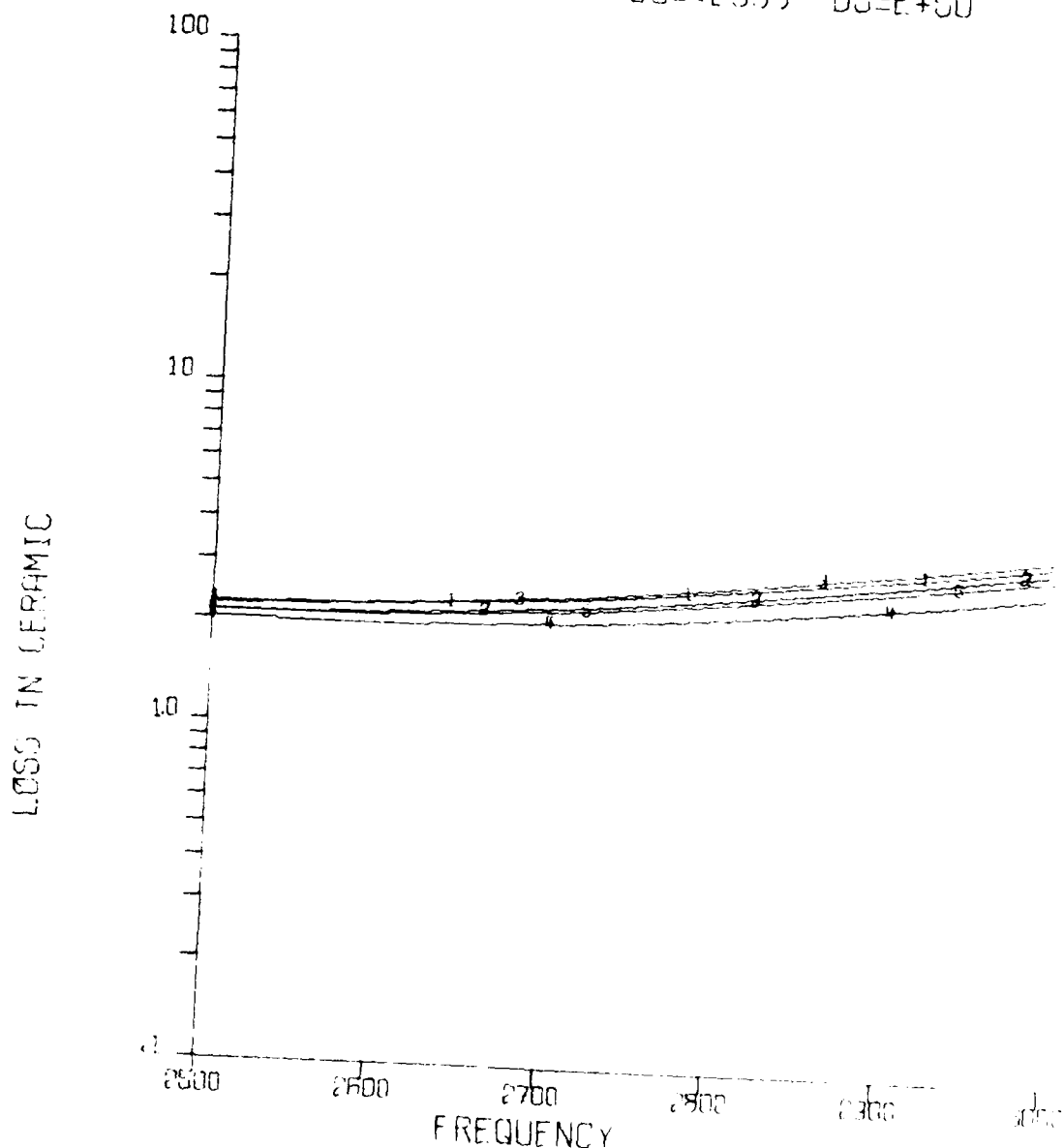
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2738 QP=E+50 CS=.2933 DS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.25781665E04

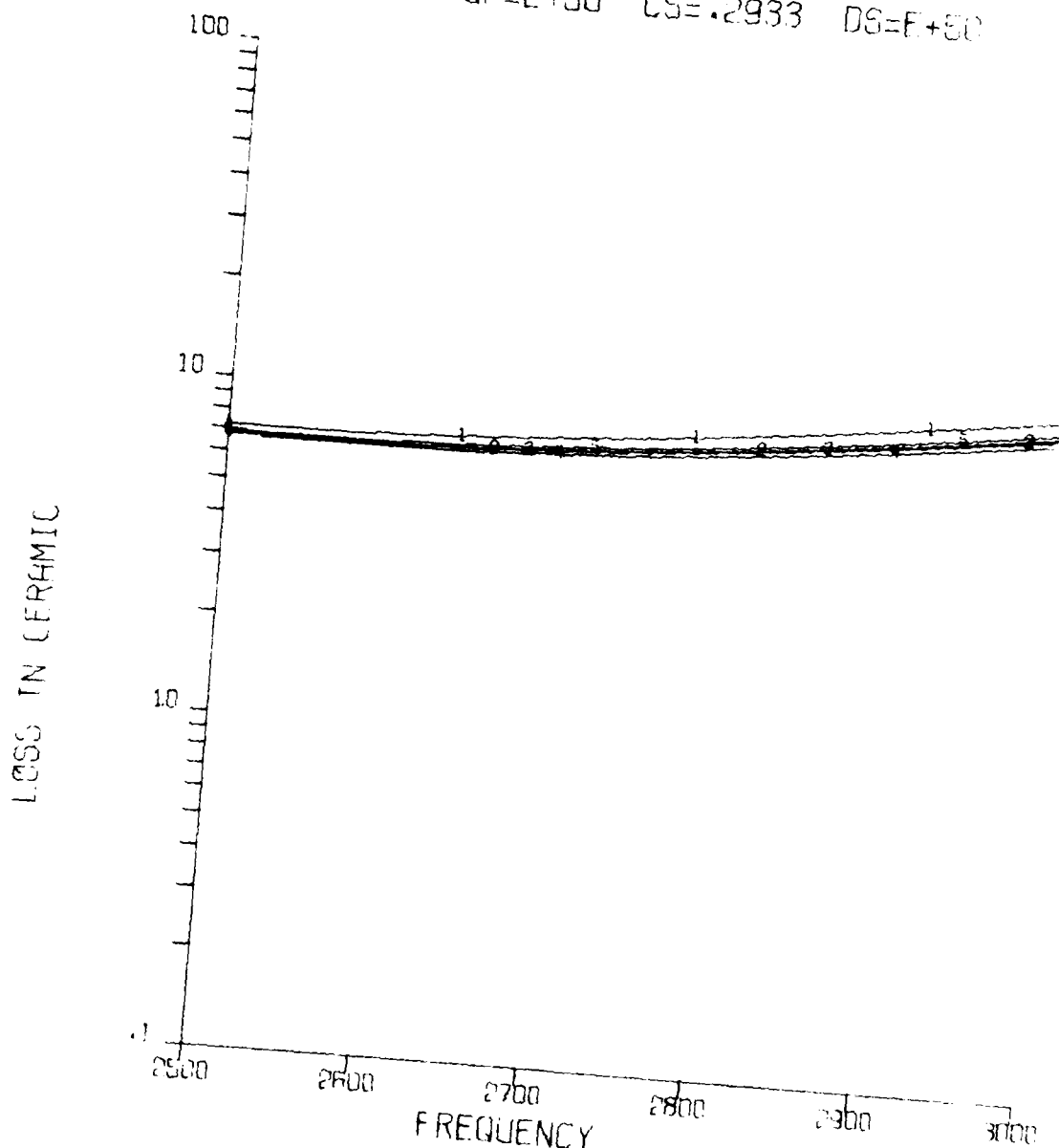
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 DS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1	- MAX	FRES=1.65302281E04+J08.10085045E03
CURVE 2	- MIN R	3.53874550E03+J01.01285799E03
CURVE 3	- MAX X	8.44770071E03+J01.01170011E04
CURVE 4	- MIN X	3.7384096E03+J01.01170011E04
CURVE 5	- AVG	3.895344E03+J01.01170011E04

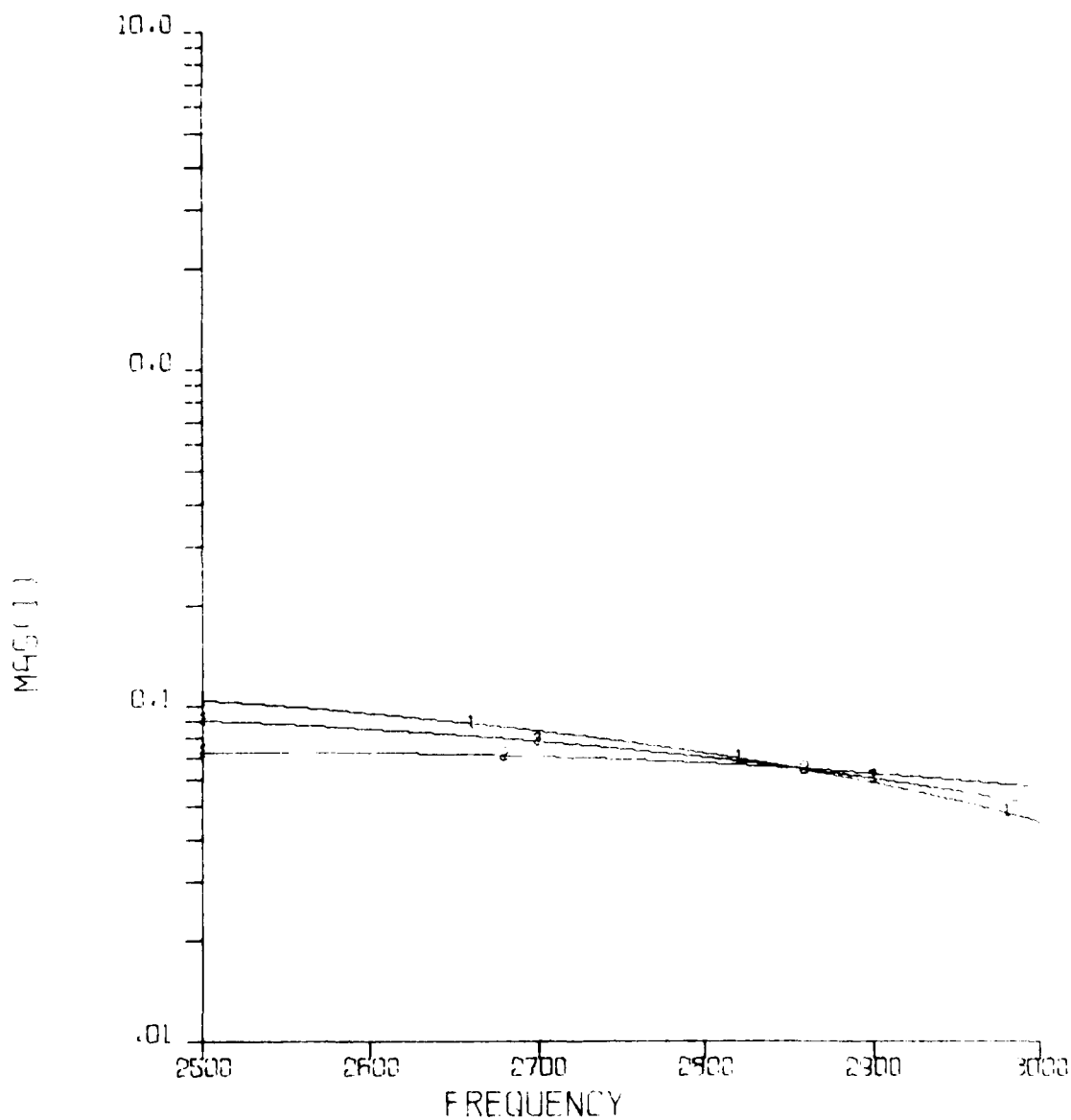
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525481E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083006E03
 CURVE 5 - AVG =5.01785712E03+J4.58678978E03

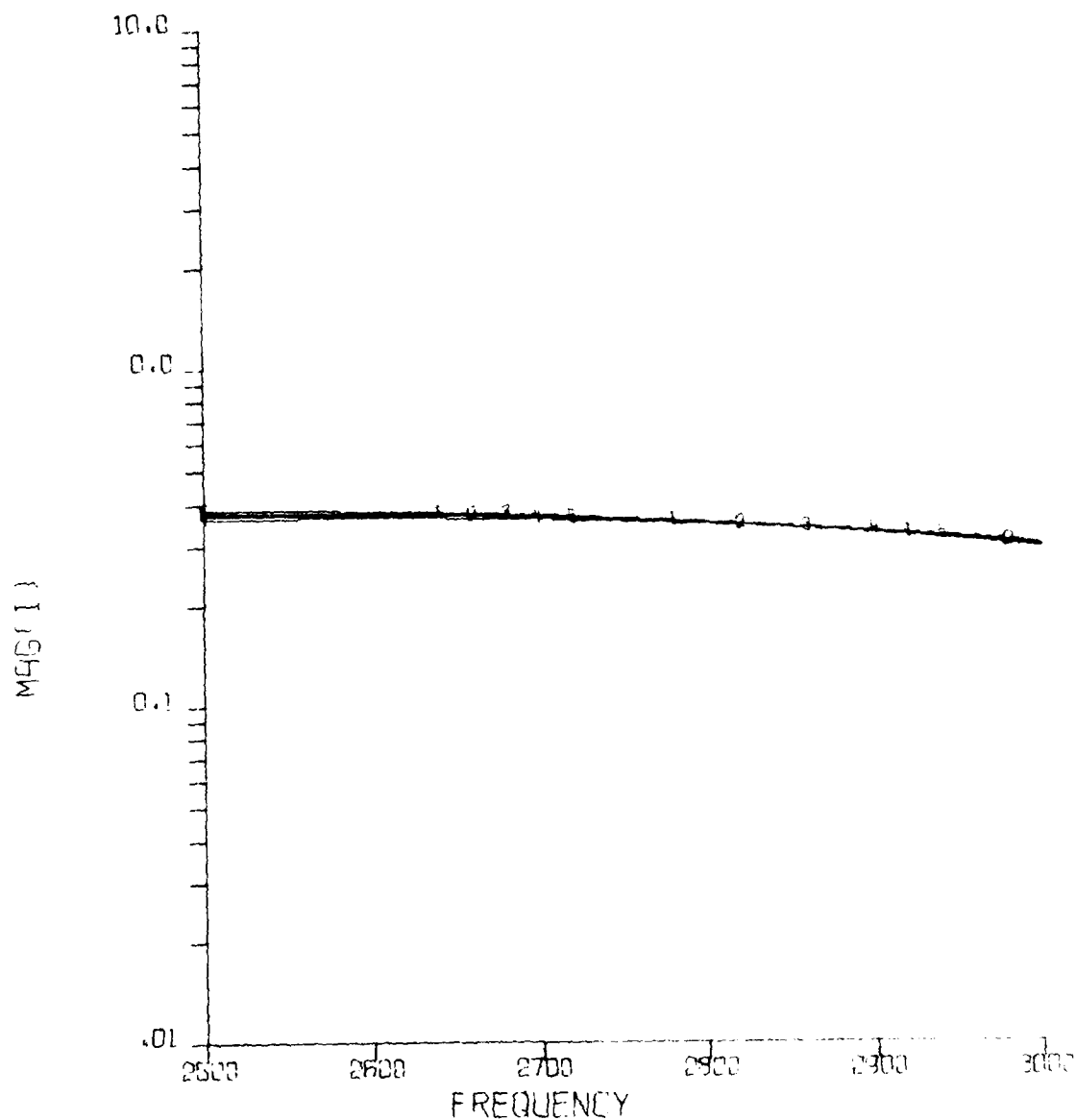
NEL DUMILBHD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.25781665E04

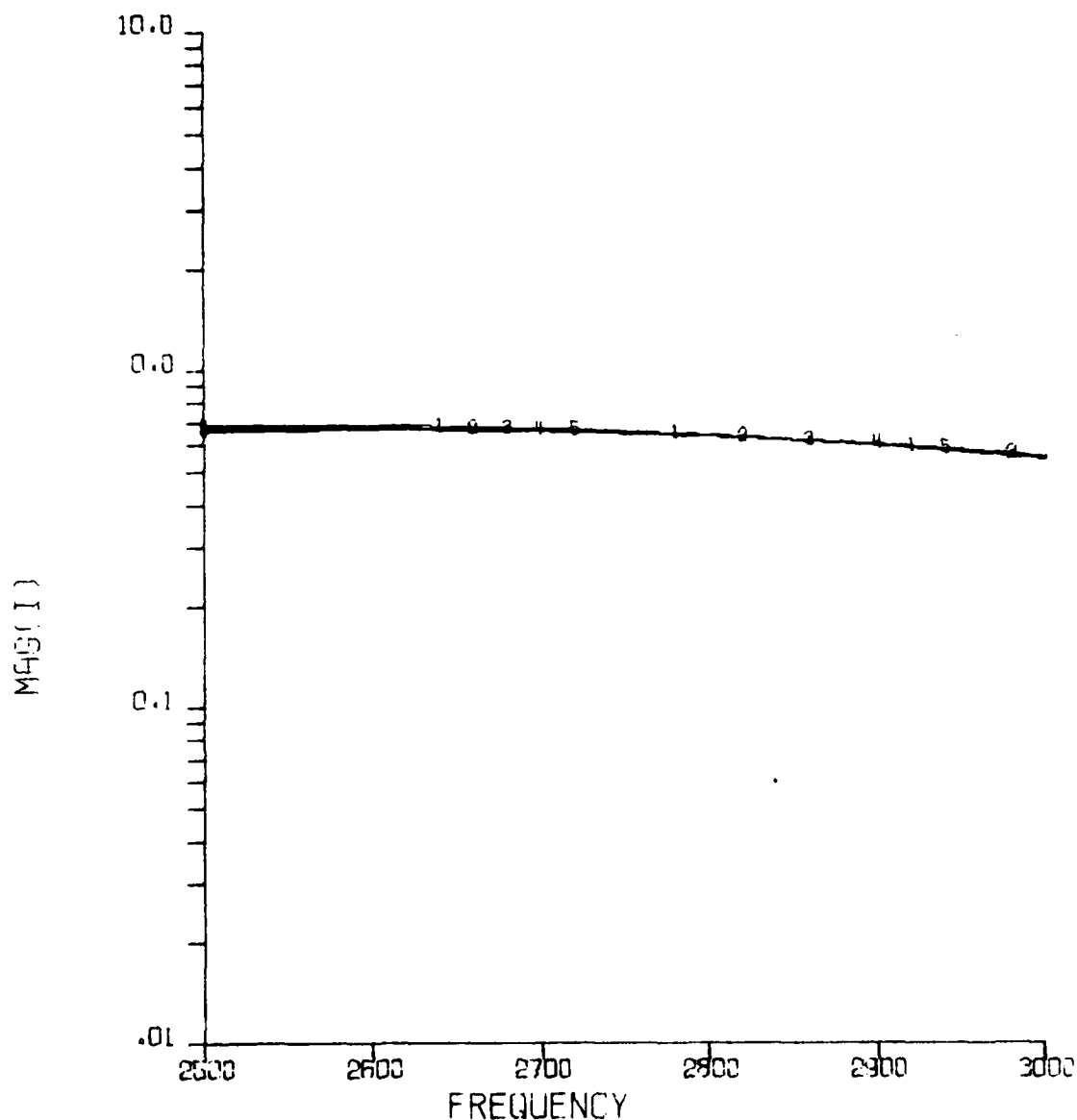
NEL DUMILORD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (C.30)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088049E03
 CURVE 2 - MIN R =3.53874890E03+J9.01298793E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617600E04
 CURVE 4 - MIN X =3.73845096E03+J1.52307033E04
 CURVE 5 - AVG =3.89504457E03+J4.39407000E03

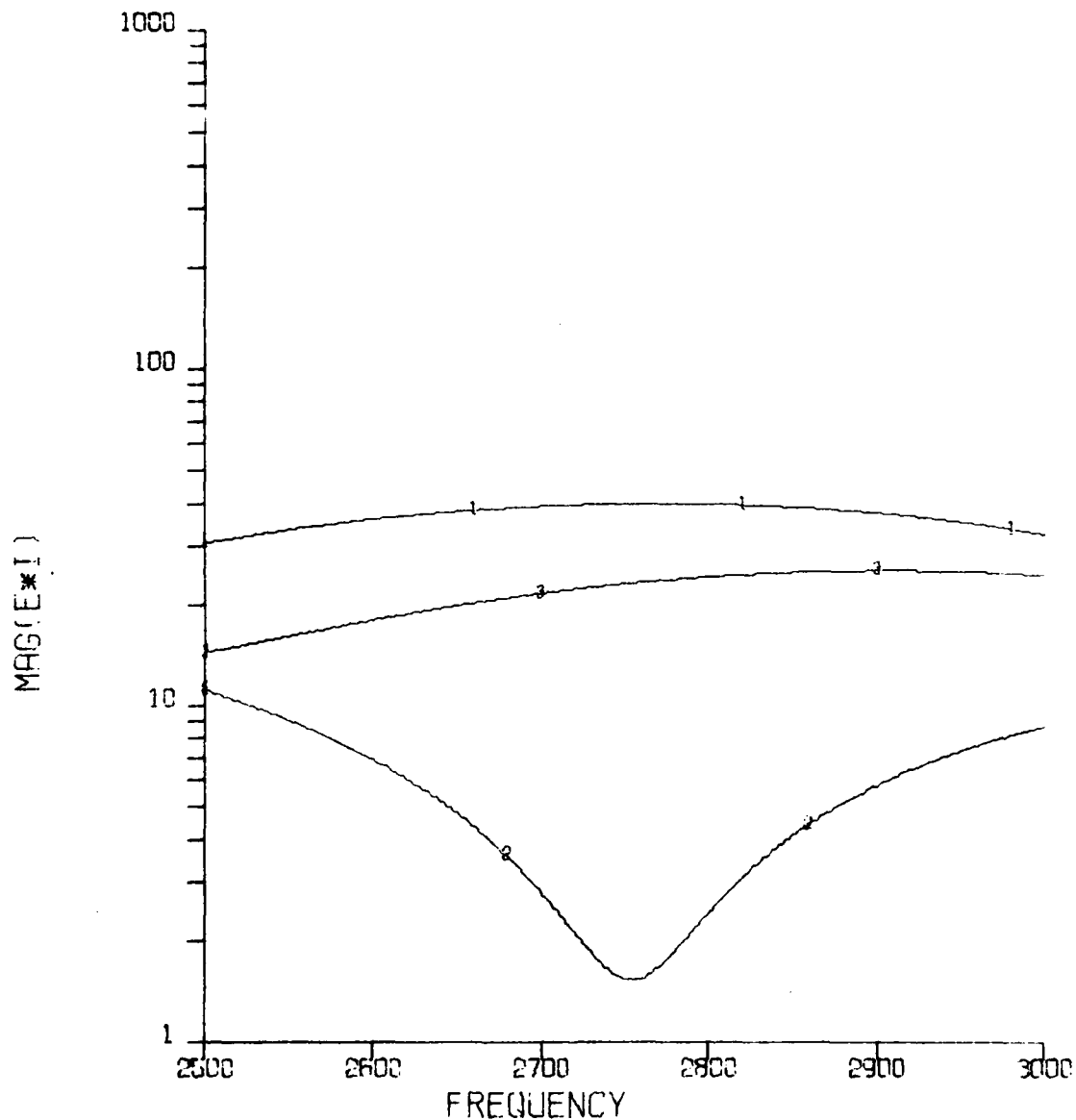
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

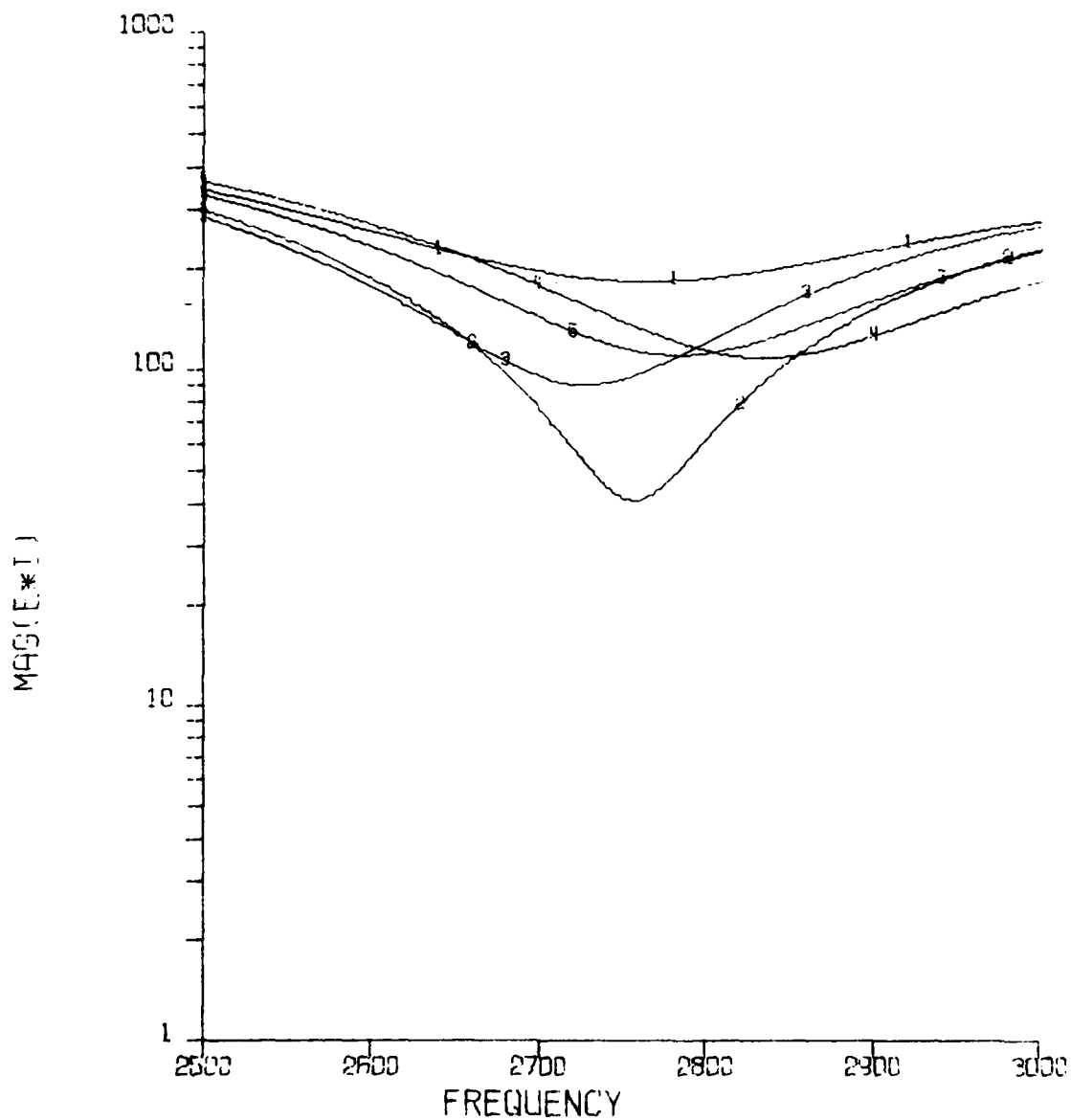
NEL DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.25781665E04

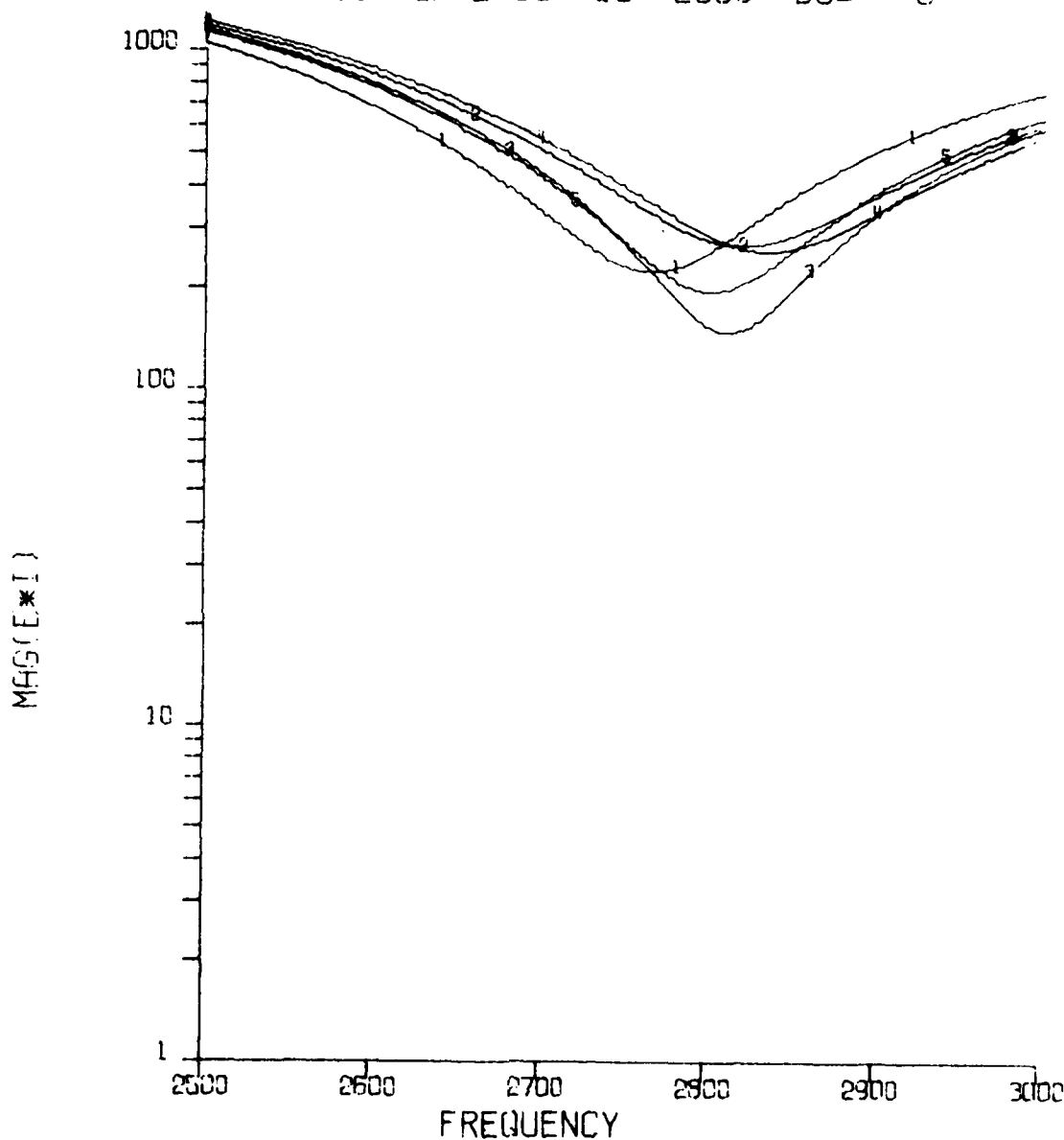
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 - MIN R =3.53874880E03+J9.01288799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73845096E03+J1.52307533E03
 CURVE 5 - AVG =9.89594457E03+J6.38905526E03

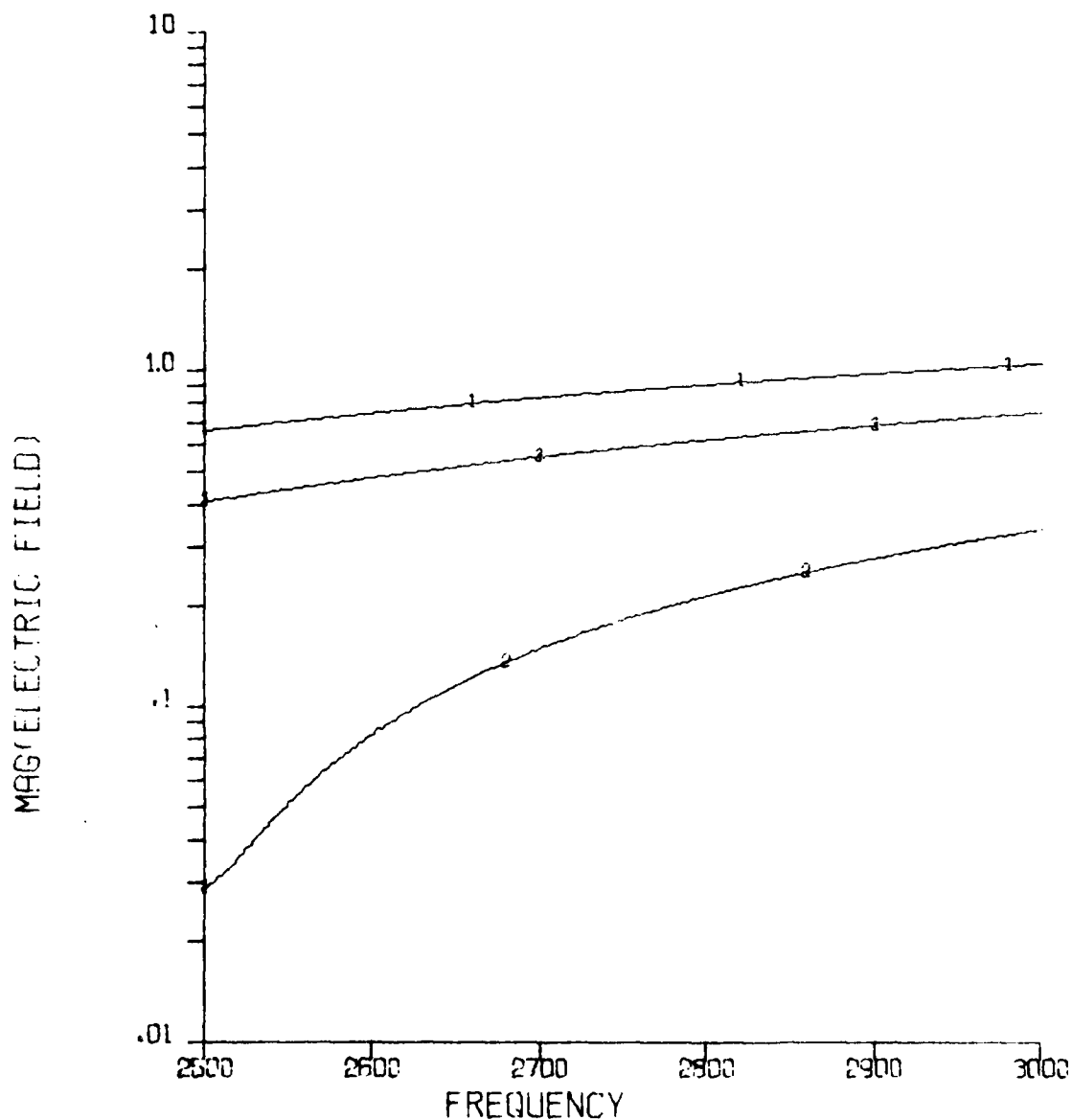
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525495E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

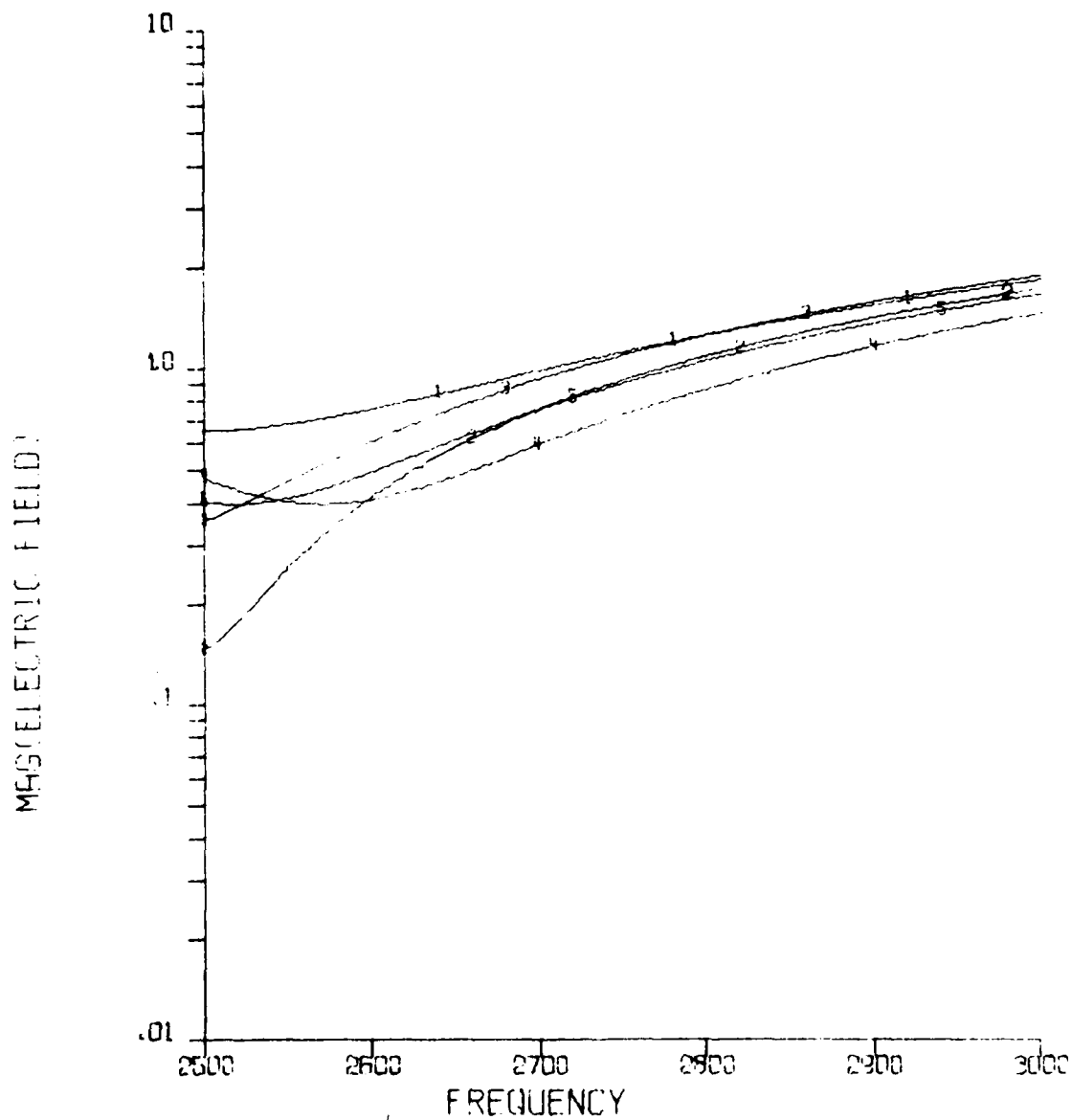
NEL DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(ELECTRIC FIELD) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.25781665E04

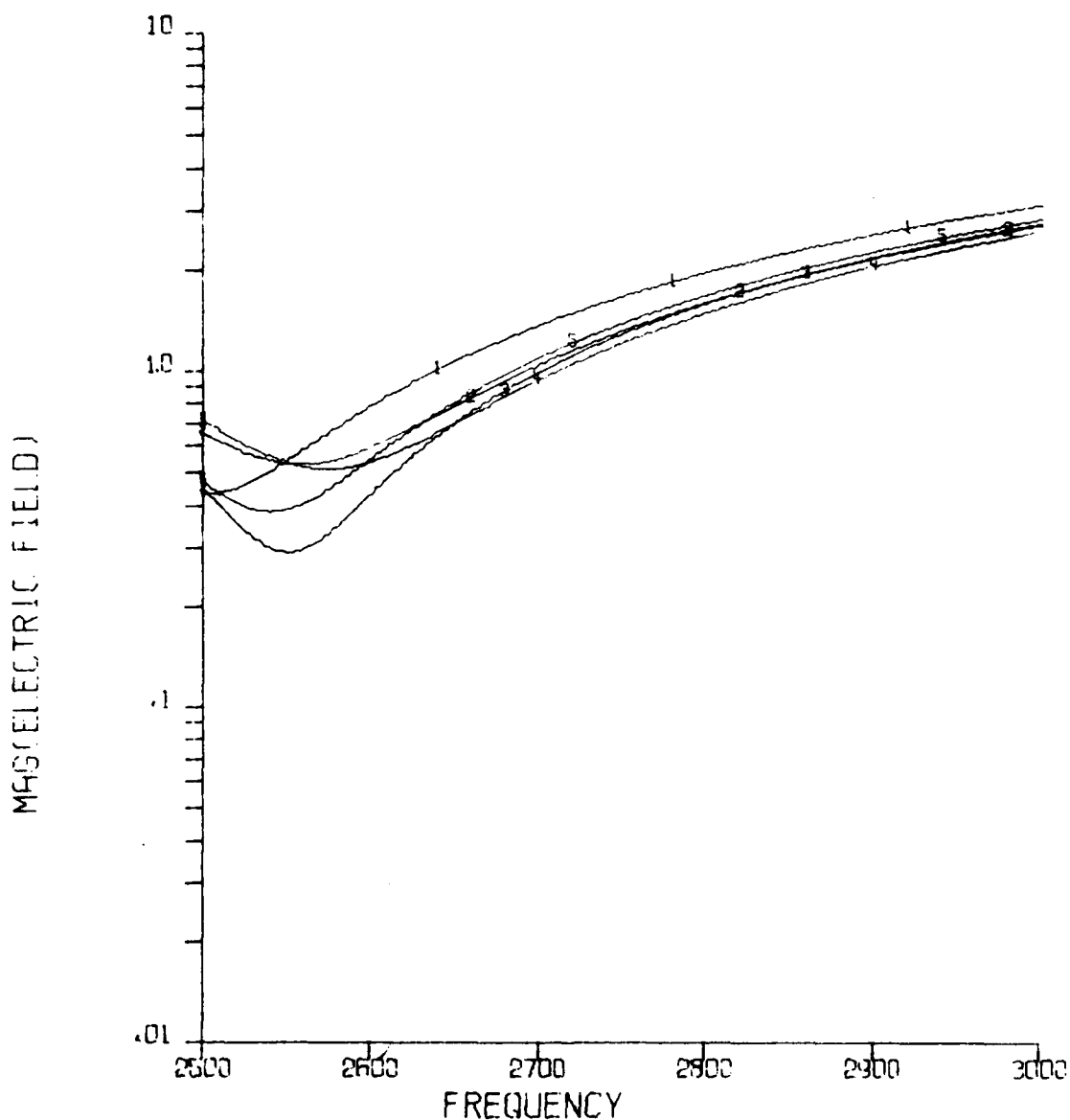
NEL DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 - MIN R =3.53874880E03+J9.01288799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73845096E03+J1.52307533E03
 CURVE 5 - AVG =9.89594457E03+J6.38905526E03

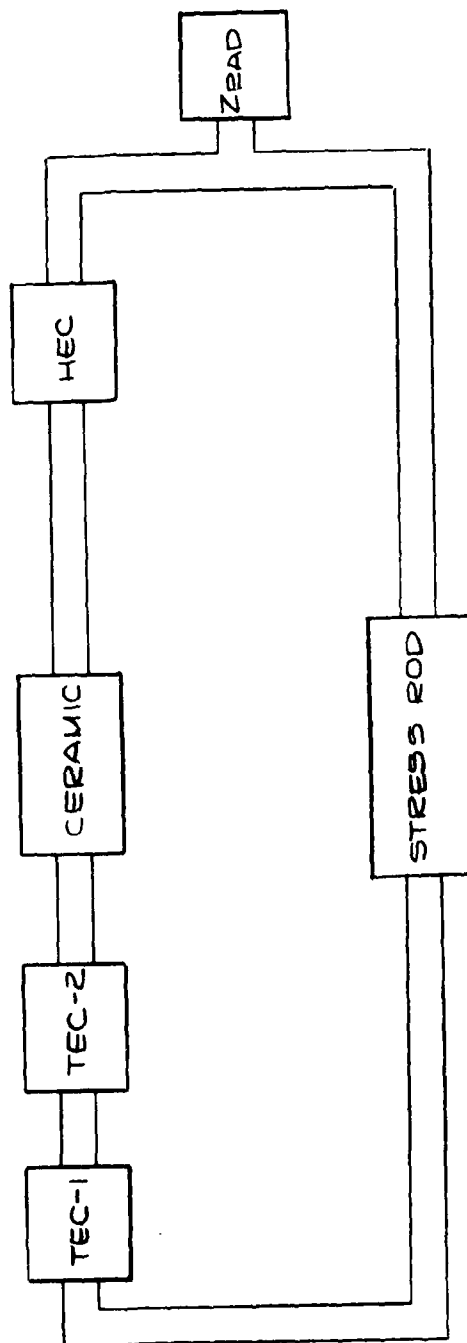
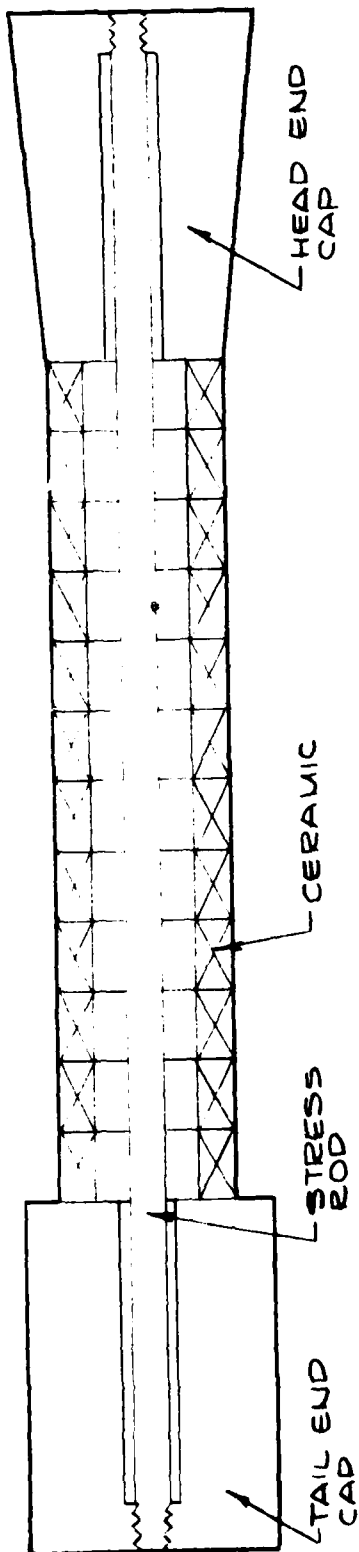
100 INCH CIRCULAR WAVE
 HIGH BAND BROADSIDE (0.90)
 LP=.2738 QP=E+50 CS=.2933 DS= 0



MAG(ELECTRIC FIELD) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

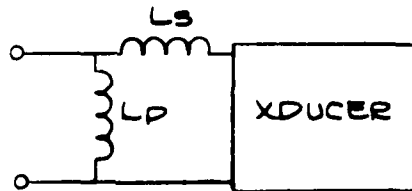
GE



GE DUMILOAD I

GENERAL ELECTRIC
DUMILOAD I C.P. I
5 INCH CIRCULAR HEAD

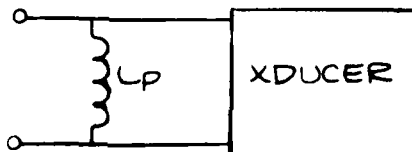
LOW BAND



$$L_s = 1.886136480 \times 10^{-1} \quad Q_s = 10^{50}$$

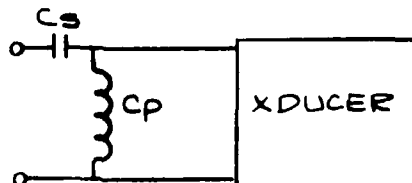
$$L_p = 3.749827389 \times 10^{-1} \quad Q_p = 10^{50}$$

MID BAND



$$L_p = 3.777030378 \times 10^{-1} \quad Q_p = 10^{50}$$

HIGH BAND



$$L_p = 2.762373461 \times 10^{-1} \quad Q_p = 10^{50}$$

$$C_s = 3.3731780 \times 10^{-8} \quad D_s = 0.0$$

DATE 4/15/66

WAVE NUMBER 2-15-6010-1

NON-PIEZOELECTRIC MATERIAL PARAMETERS
ACTIVE TRANSDUCER
CURRENT CONTROL

SECTION NAME	PIECE NO.	PIECE TYPE	DENSITY	LENGTH	LEFT AREA	RIGHT AREA	LONGITUDINAL VEL. OF SOUND
TAIL END CAP	1	0	7.800000E 03	1.900000E-02	3.780000E-04	3.780000E-04	5.050000E 03
	2	0	7.800000E 03	3.580000E-02	1.269000E-02	1.269000E-02	5.050000E 03
STRESS ROD	1	0	7.800000E 03	4.414000E-01	1.267000E-04	1.267000E-04	5.050000E 03
	1	1	2.700000E 03	1.000000E-01	2.134000E-03	1.269000E-02	5.104000E 03

INPUT PARAMETERS FOR TRANSDUCER ANALYSIS
ACTIVE CERAMIC PARAMETERS

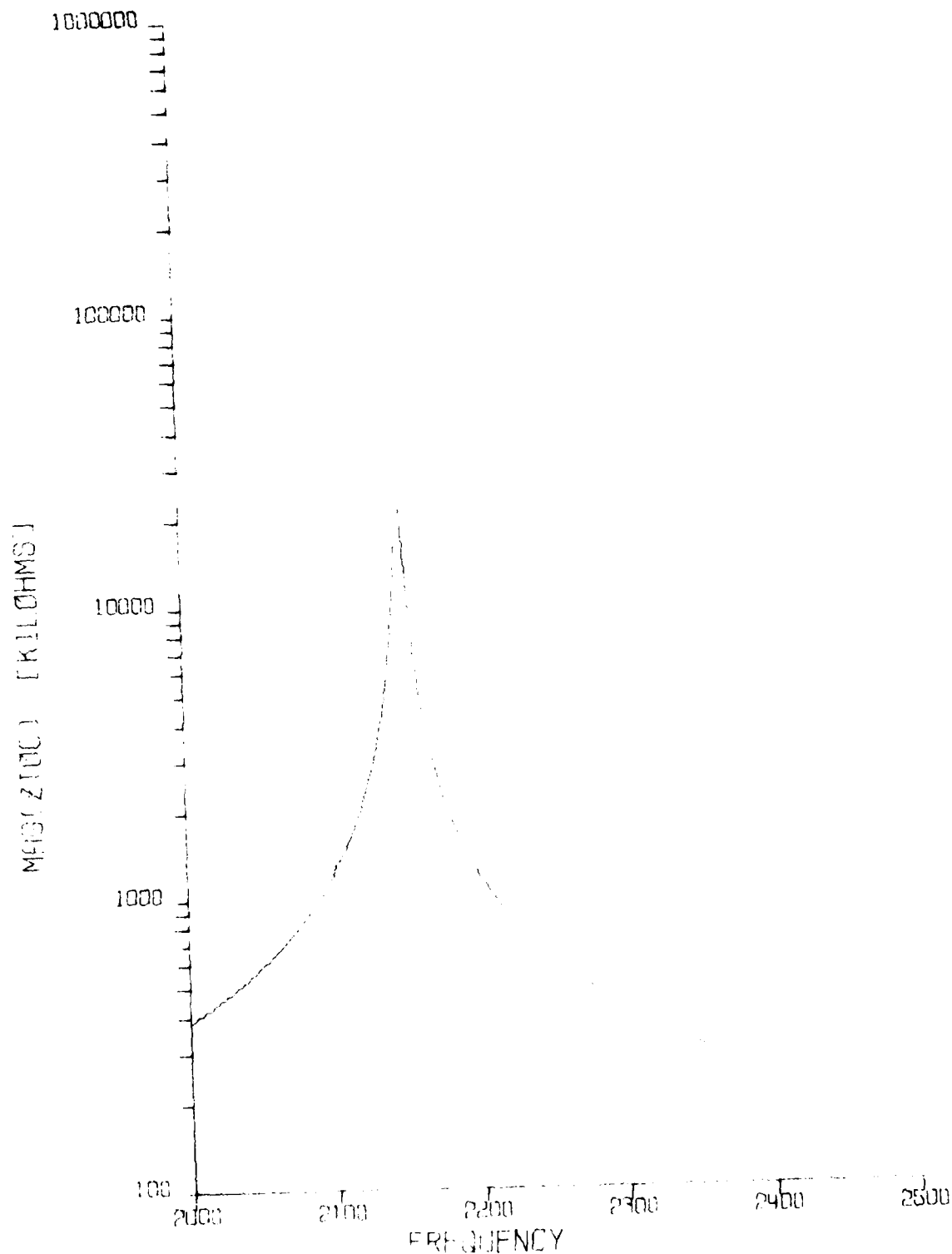
NO. OF RINGS	REAL	IMAGINARY	DENSITY	AREA	LENGTH	REAL	IMAGINARY	E333
12	1.020550E-11	-2.480957E-14	7.440000E 03	2.279840E-02	1.744300E-05	1.280360E 03	-2.929464E 00	

TRACOR, INC.

LOW BAND

C.P. 1 5 INCH CIRCULAR HEAD
LOW BAND

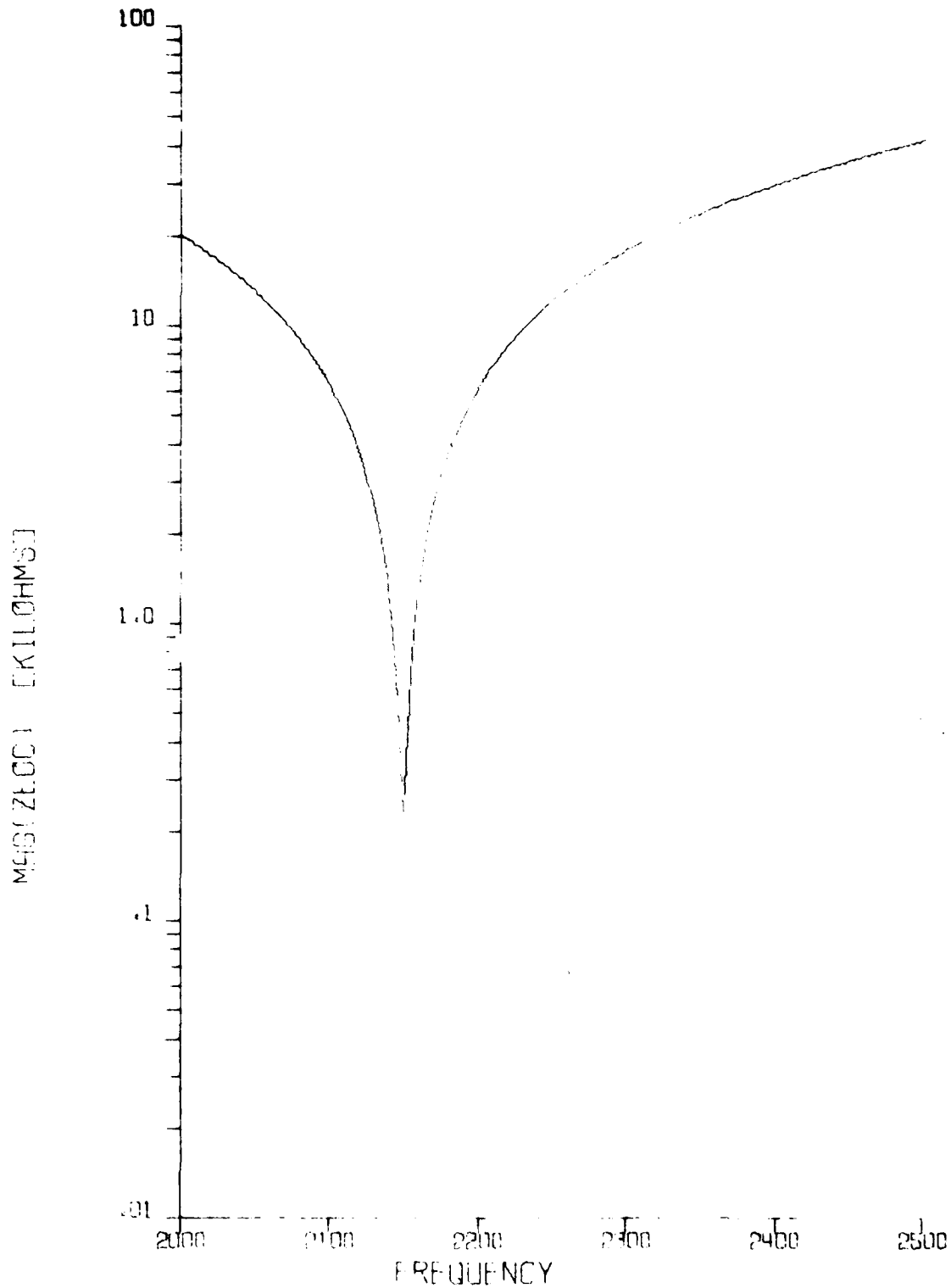
LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(Z100) VERSUS FREQUENCY

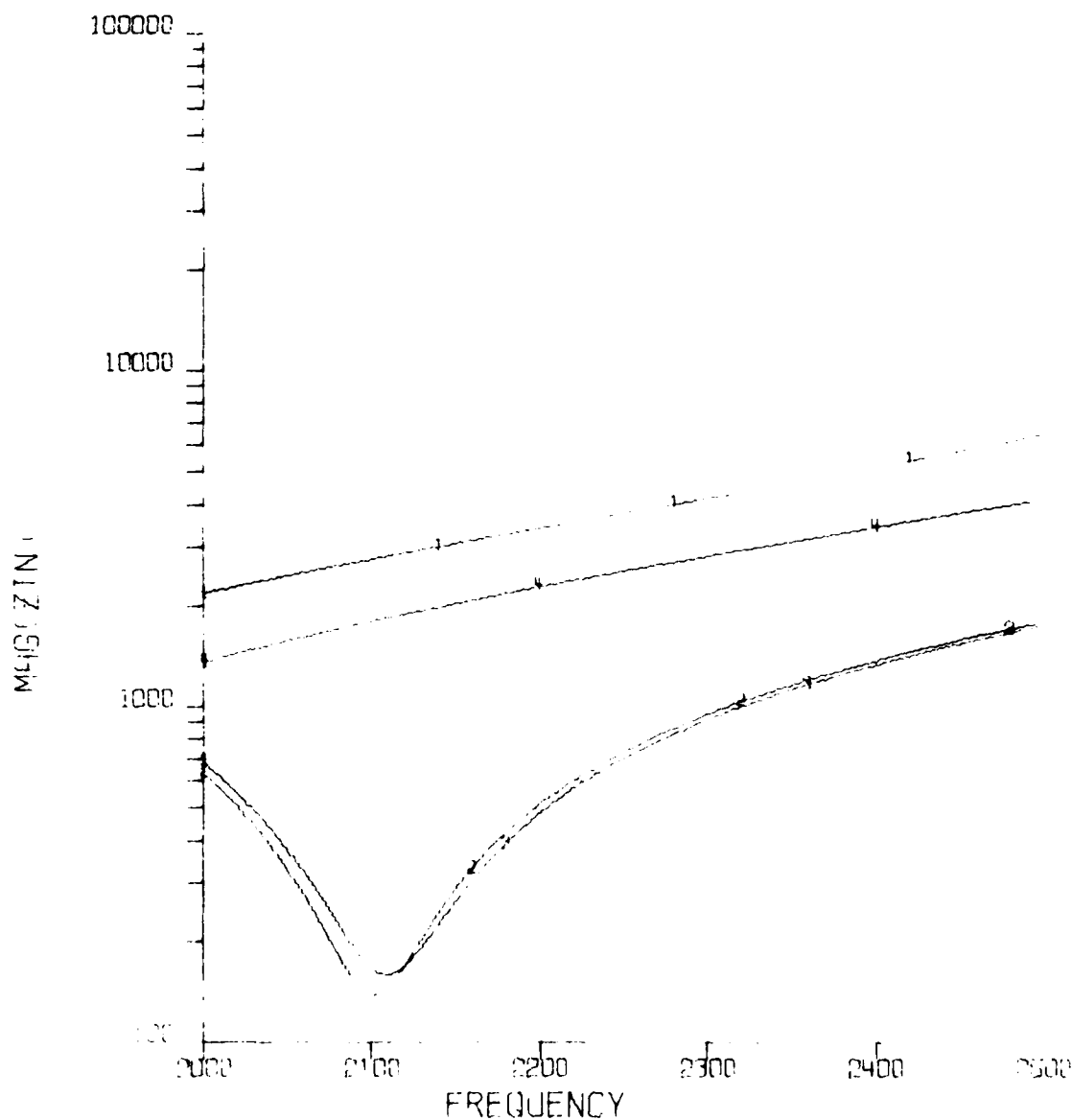
CE DOWLEND 1
C.P. 1 5 INCH CIRCULAR HEAD
LOW BAND

LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(ZECC) VERSUS FREQUENCY

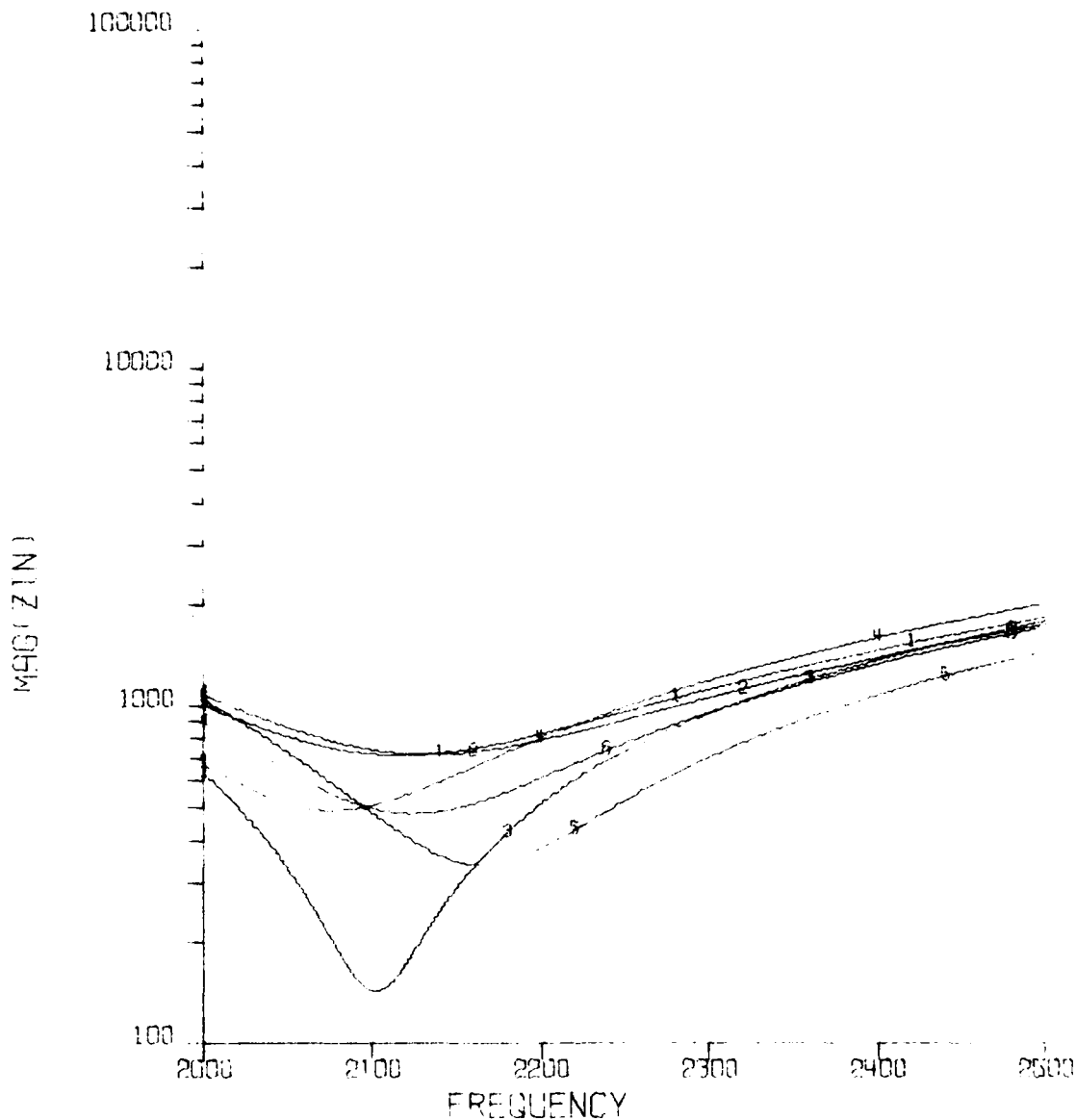
GE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1	MAX PRE S	3.08590054E 04 + J6.84589403E 04
CURVE 2	MIN R	3.06235372E 03 + J6.15220508E 03
CURVE 3	MIN X	3.057300870E 03 + J5.19126037E 03
CURVE 4	AVG	3.044205729E 04 + J4.33216357E 04

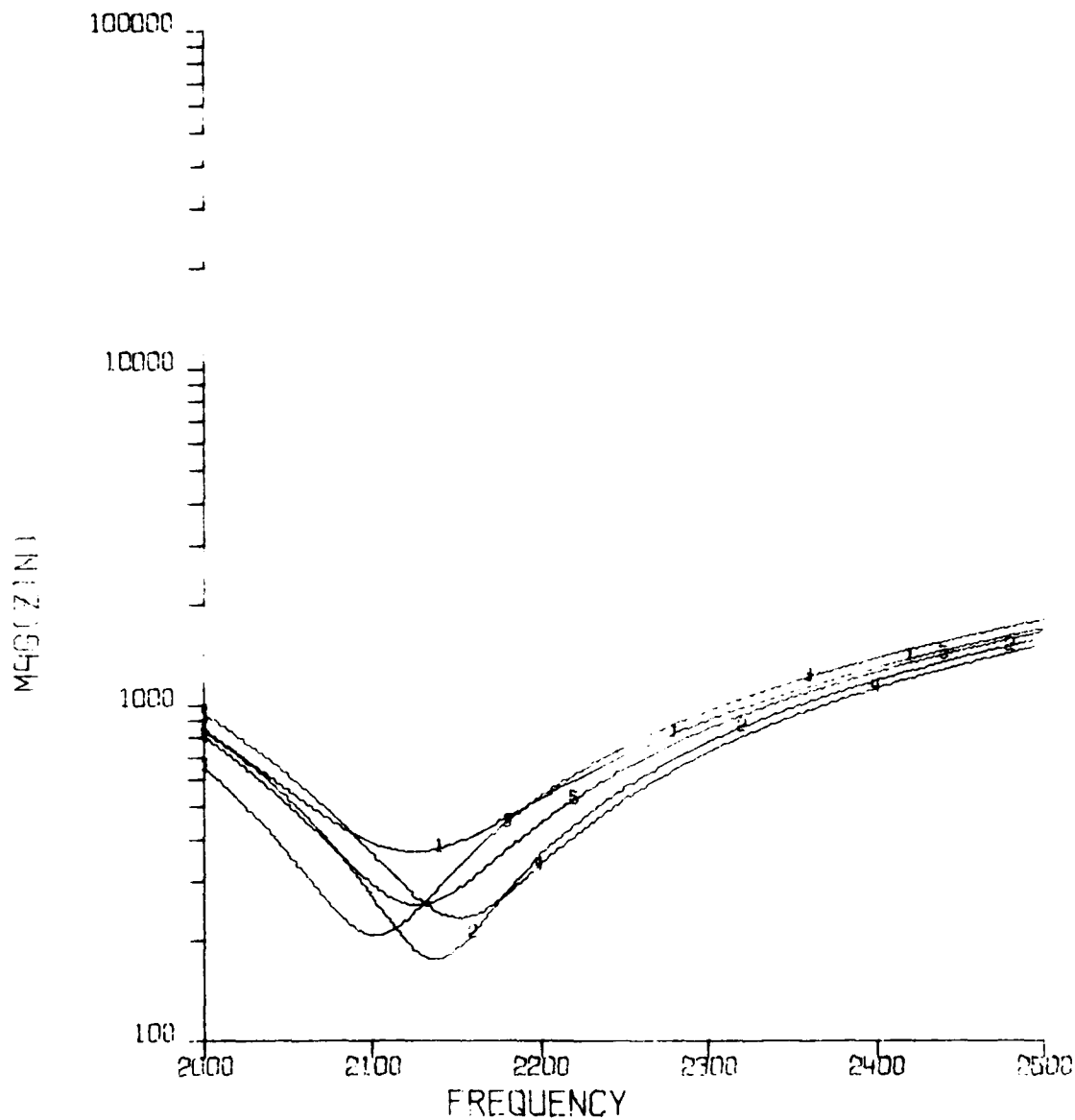
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =3.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.117598E04+J3.81251049E03

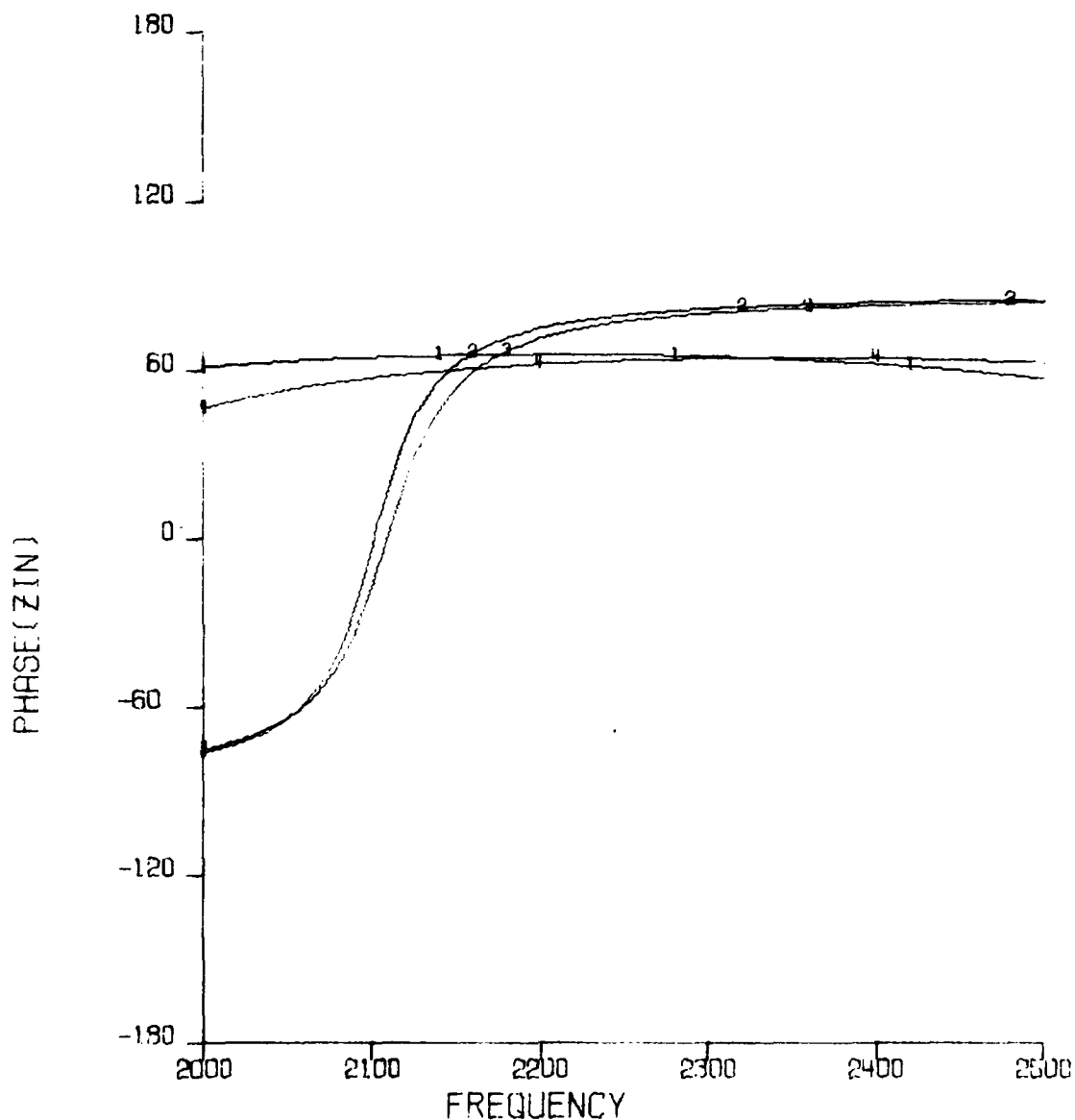
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

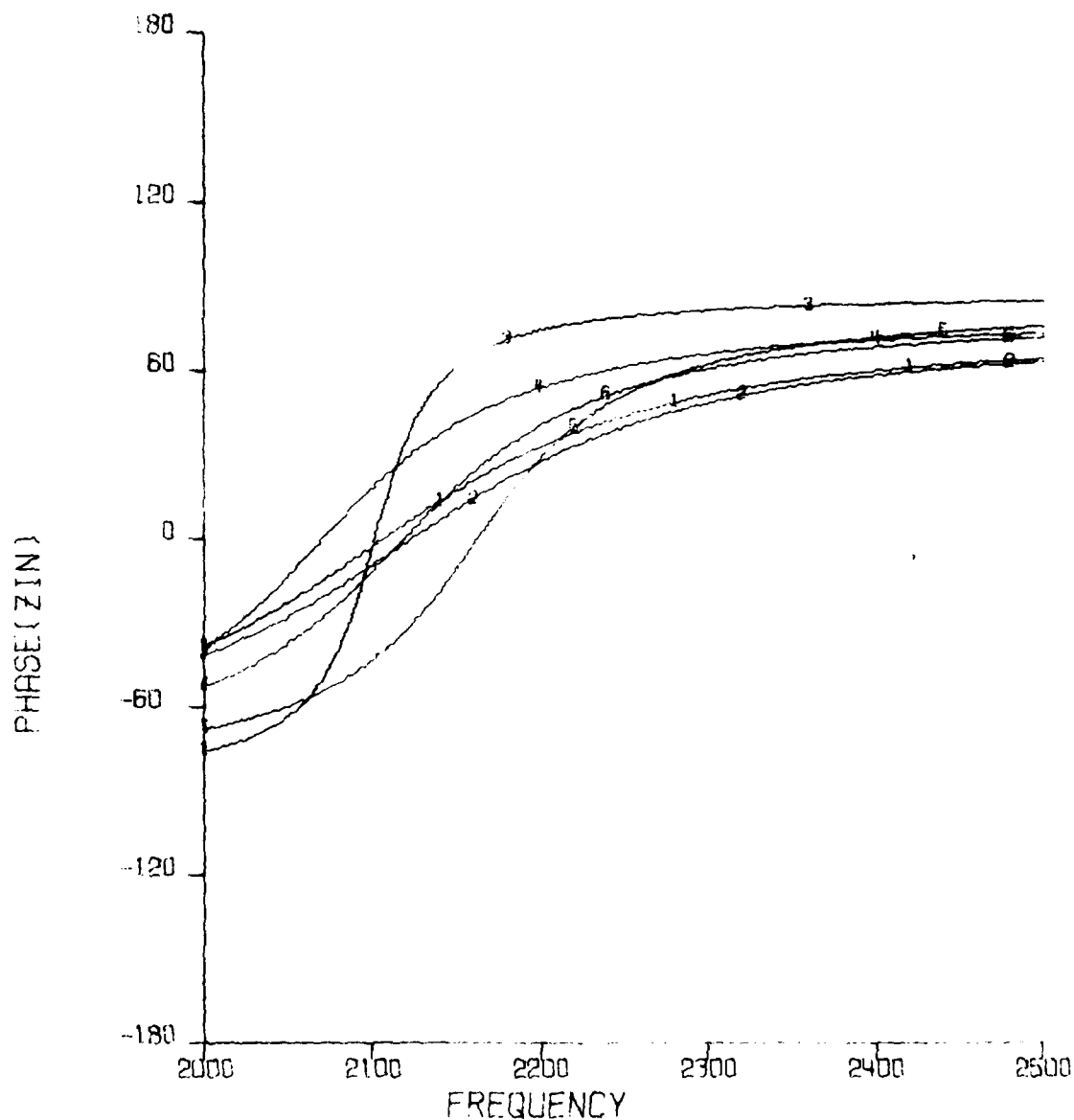
GE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

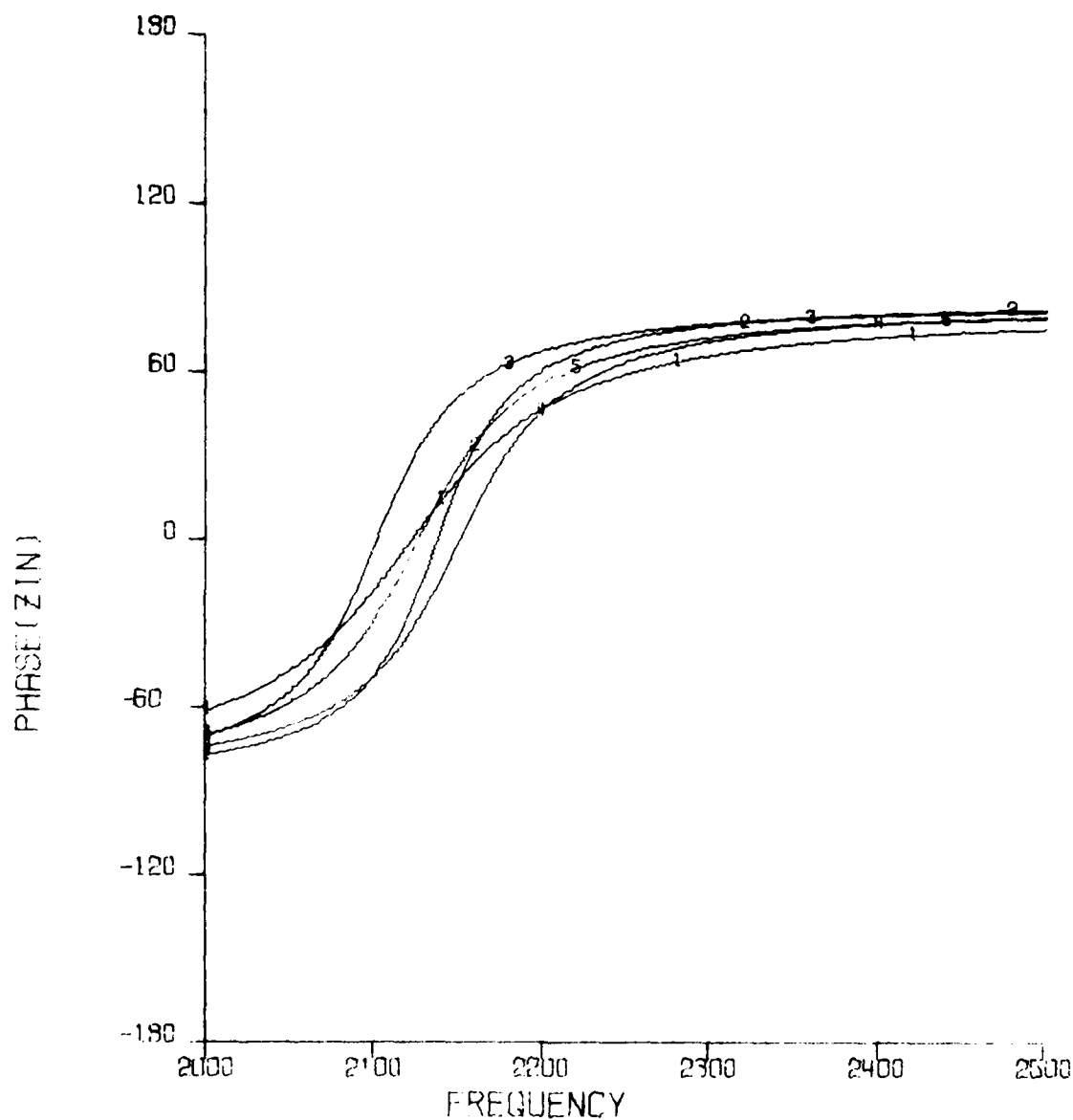
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

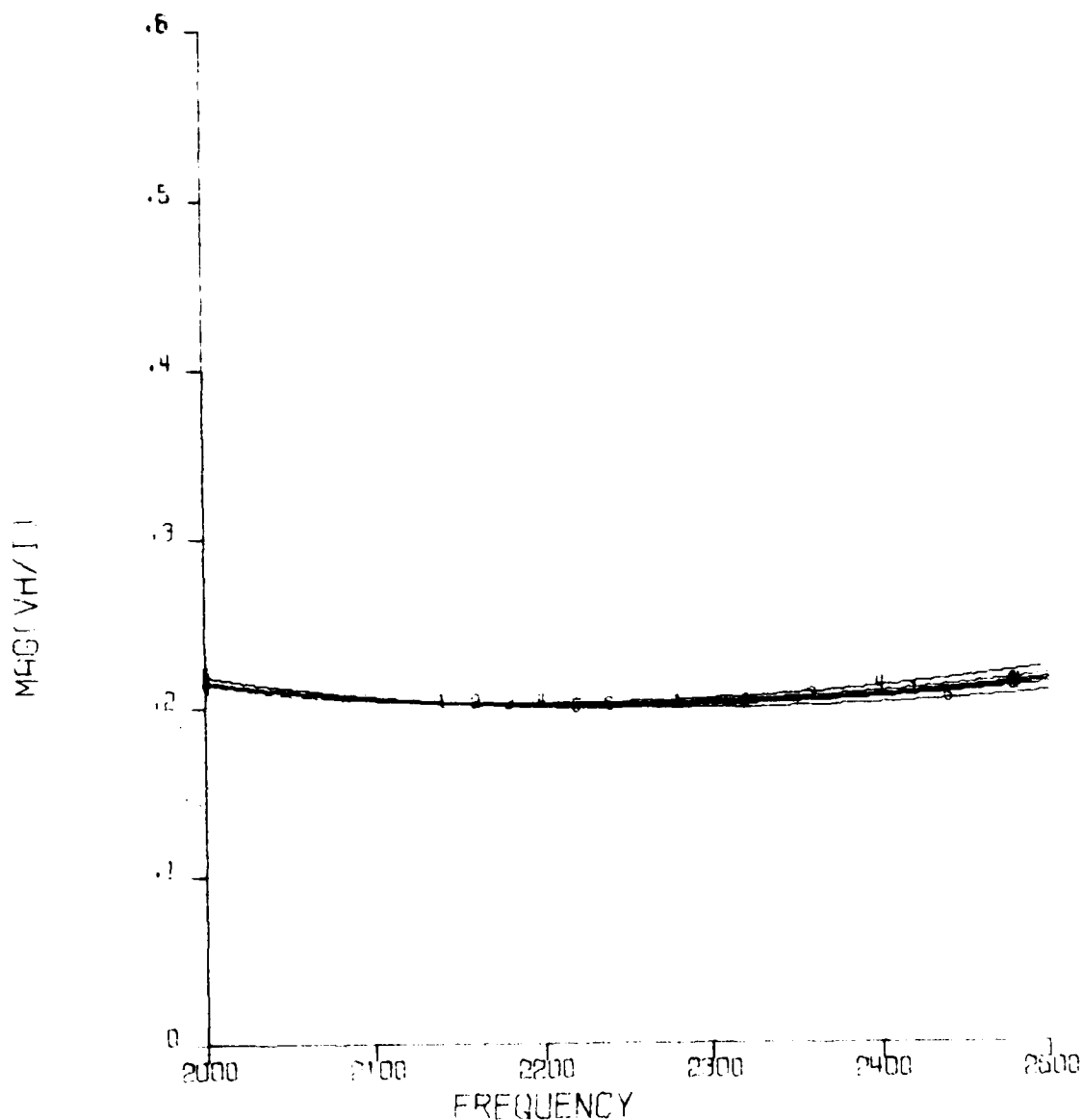
CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

A line graph showing the relationship between M/G (VH/L) on the y-axis and FREQUENCY on the x-axis. The y-axis ranges from 0 to 0.6 with increments of 0.1. The x-axis ranges from 2000 to 2500 with increments of 100. Three curves are plotted, labeled 1, 2, and 3. Curve 1 starts at approximately (2000, 0.21), dips slightly to (2100, 0.20), and then rises to (2500, 0.33). Curve 2 starts at approximately (2000, 0.19), dips slightly to (2100, 0.19), and then rises to (2500, 0.27). Curve 3 starts at approximately (2000, 0.18), dips slightly to (2100, 0.18), and then rises to (2500, 0.21).

FREQUENCY	M/G (VH/L) - Curve 1	M/G (VH/L) - Curve 2	M/G (VH/L) - Curve 3
2000	0.21	0.19	0.18
2100	0.20	0.19	0.18
2200	0.21	0.20	0.19
2300	0.23	0.22	0.20
2400	0.28	0.24	0.20
2500	0.33	0.27	0.21

CURVE 1 - MAX PRES=3.06590054E04+J6.84589406E04
CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
CURVE 3 - MIN X =3.57300970E03+J5.19126057E03
CURVE 4 - AVG =2.44205725E04+J4.33216357E04

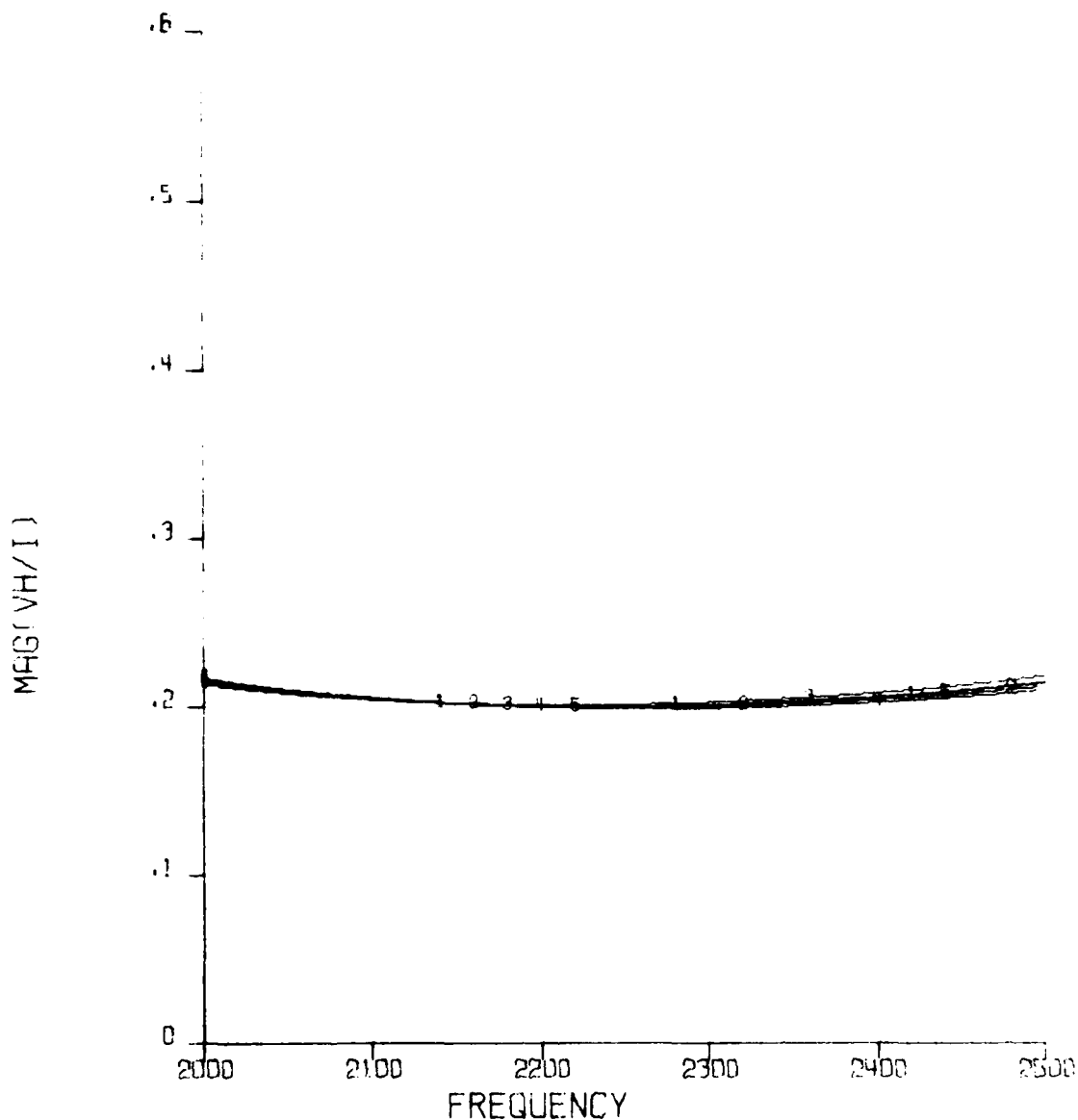
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1886 OS=E+50 LP=.3750 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18575532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.10960299E03 J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

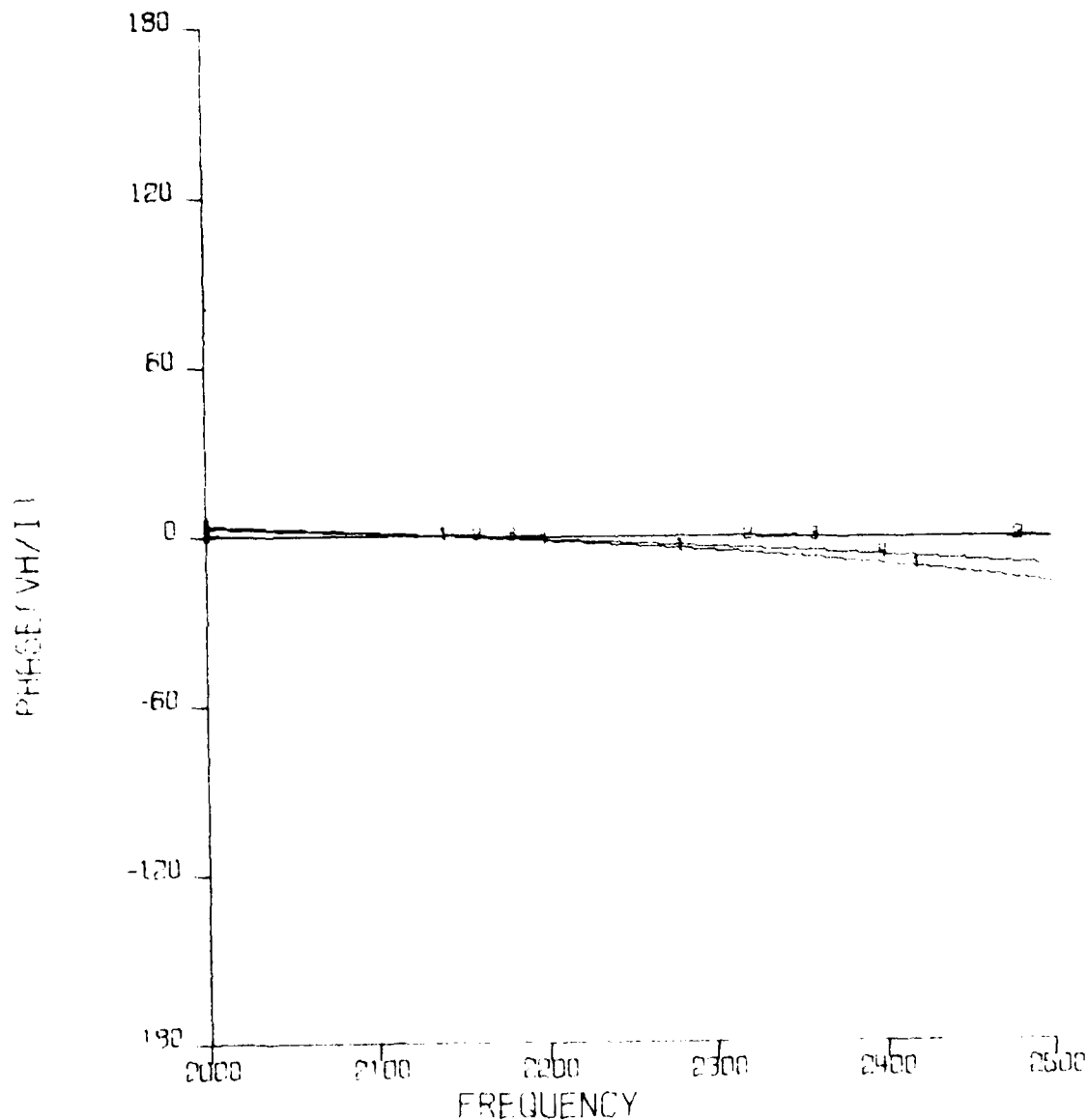
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

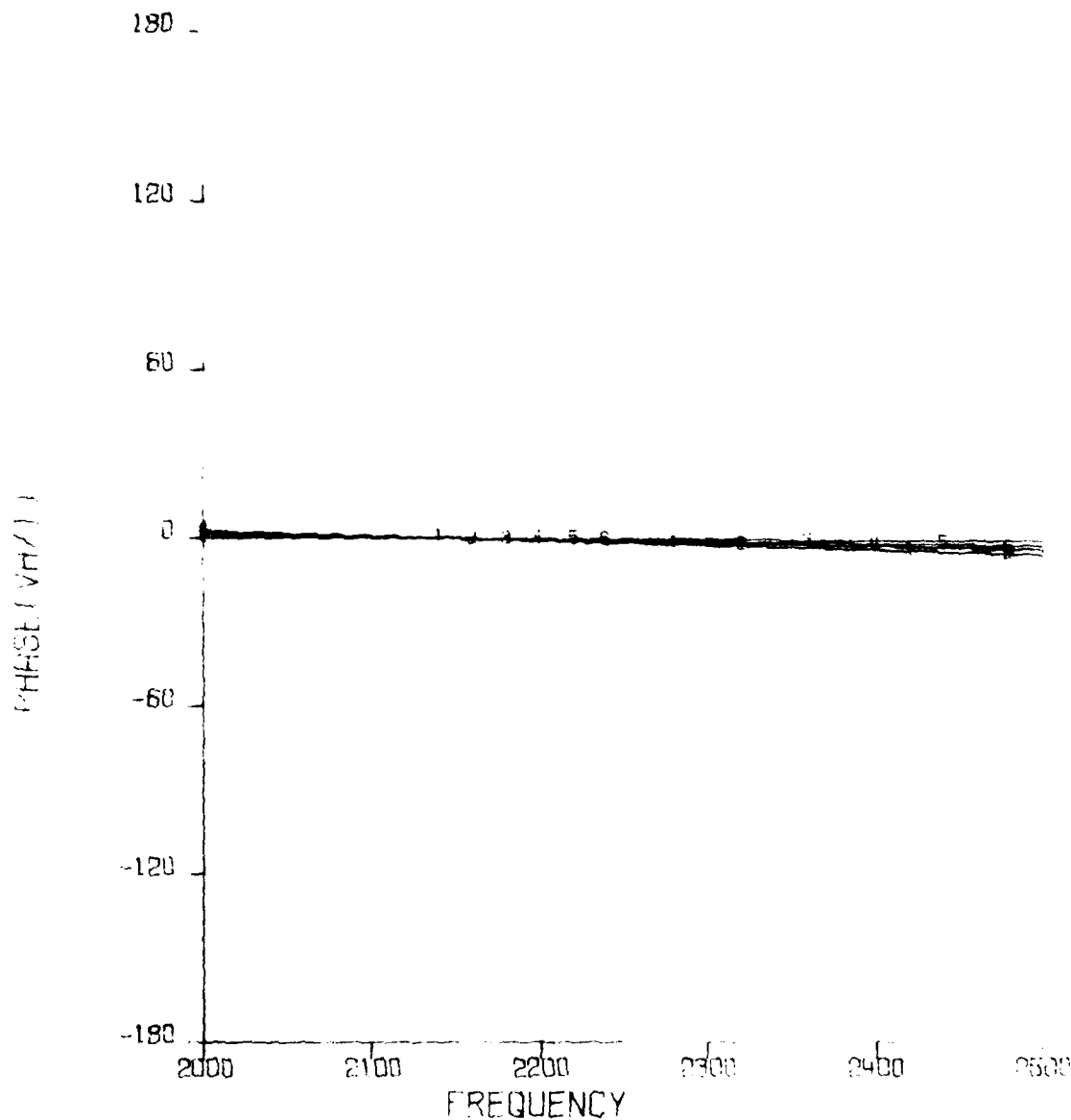
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRE $= 3.018590054E04 + J6.84589403E04$
 CURVE 2 - MIN R $= 3.06295372E03 + J6.15220308E03$
 CURVE 3 - MIN X $= 3.57300970E03 + J5.19126037E03$
 CURVE 4 - AVG $= 2.44205725E04 + J4.33216357E04$

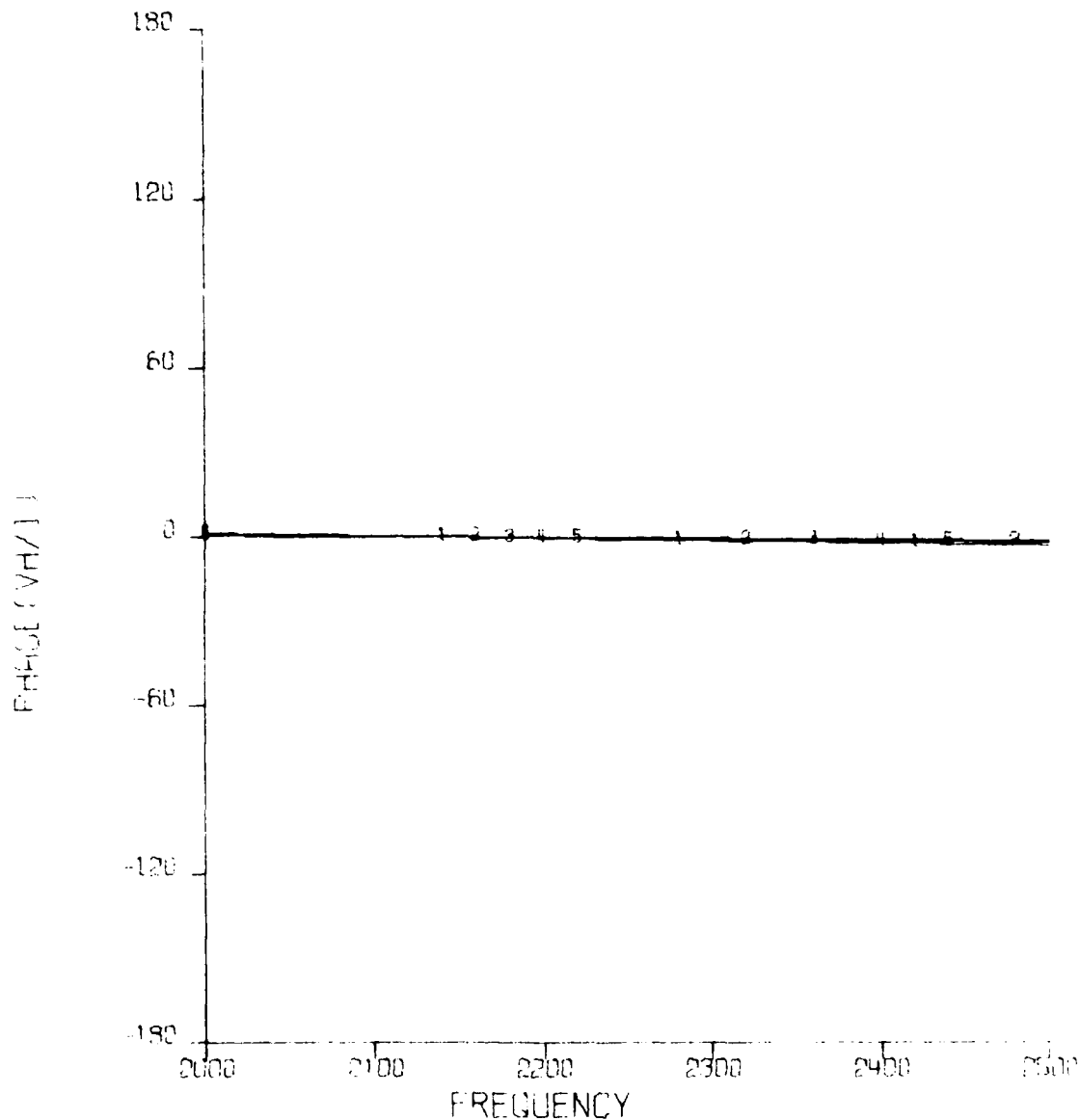
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1886 OS=E+50 LP=.3750 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03+J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

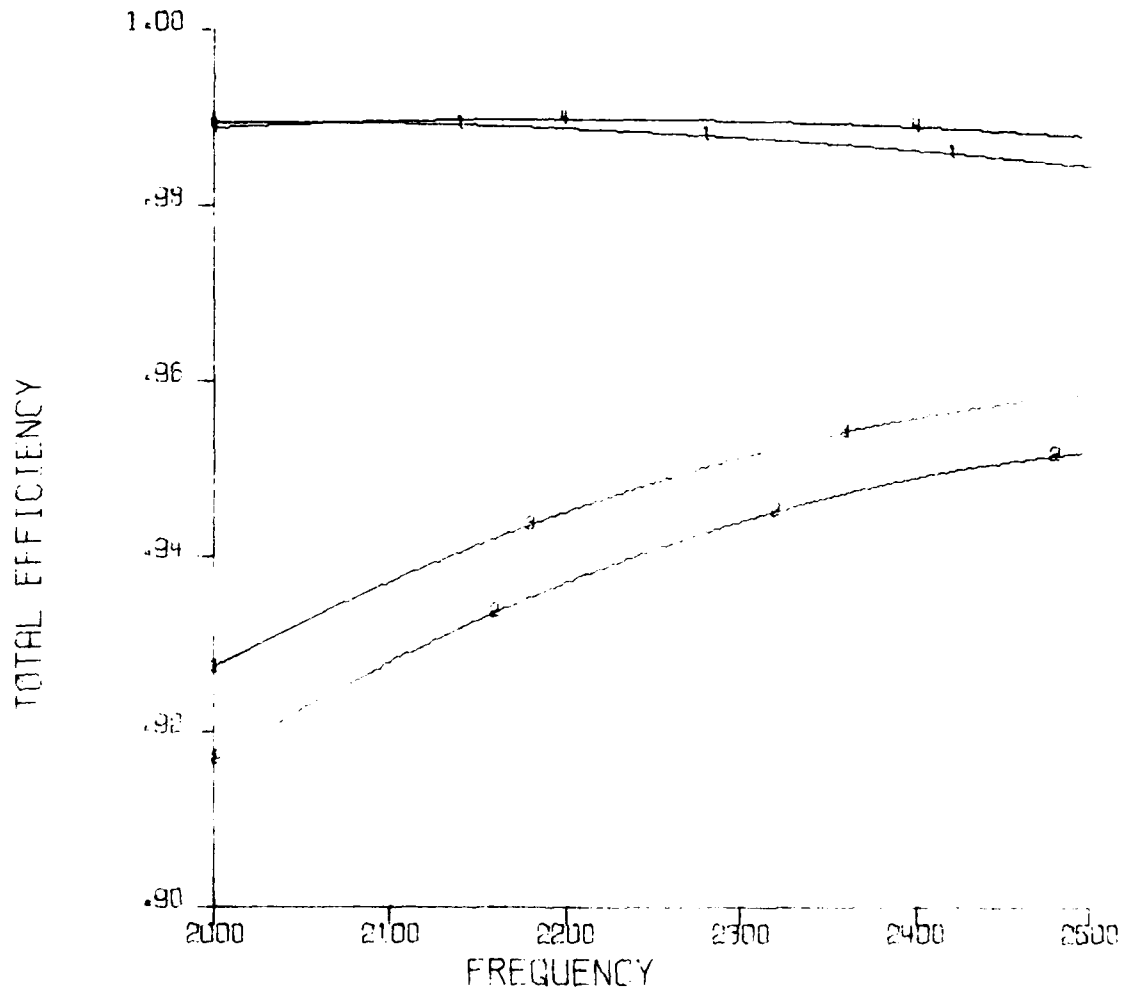
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 OS=E+50 LP=.3750 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58532185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22778241E03
 CURVE 4 - MIN X =5.48191309E03 J1.07796008E03
 CURVE 5 - AVG =5.42082810E03+J3.08428731E03

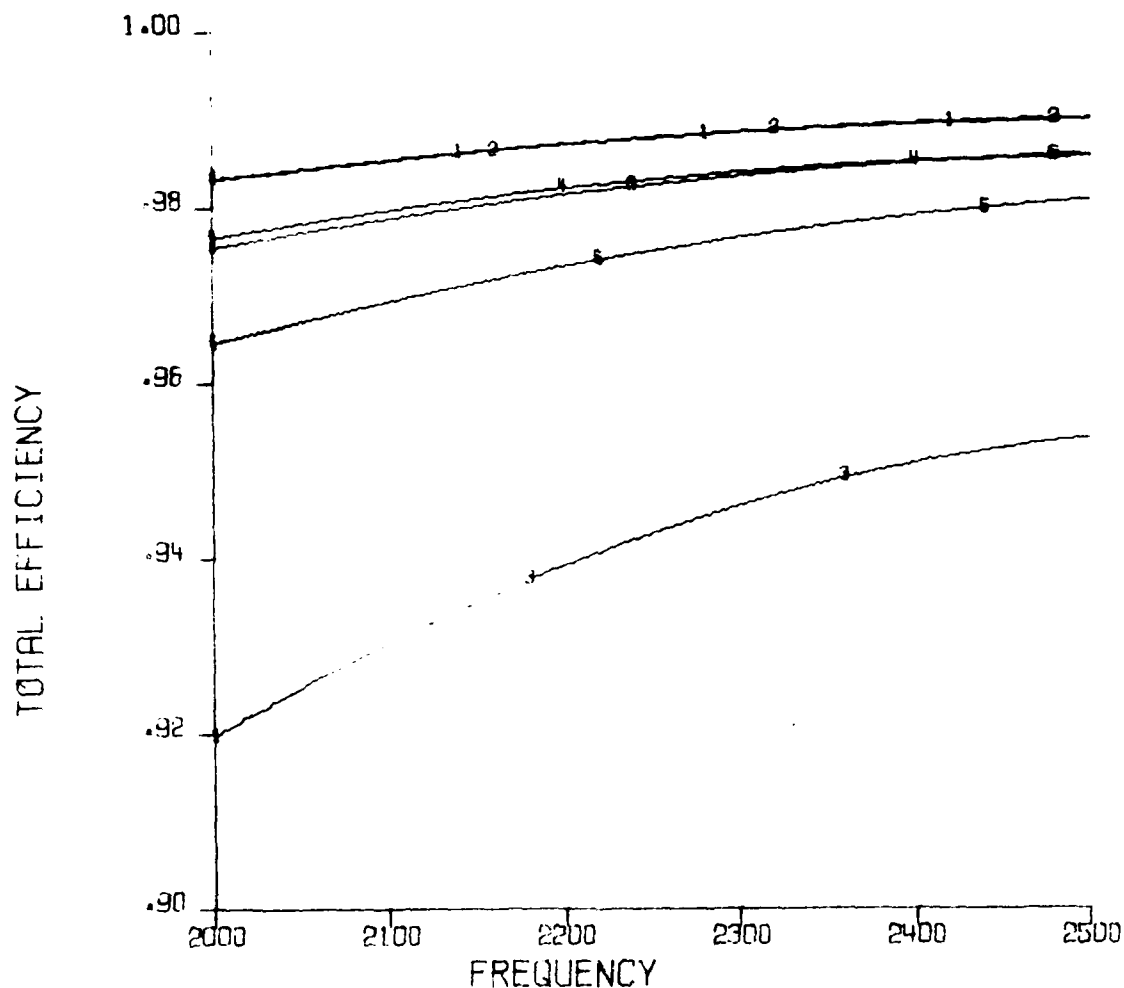
GE DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 OS=E+50 LP=.3750 QP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

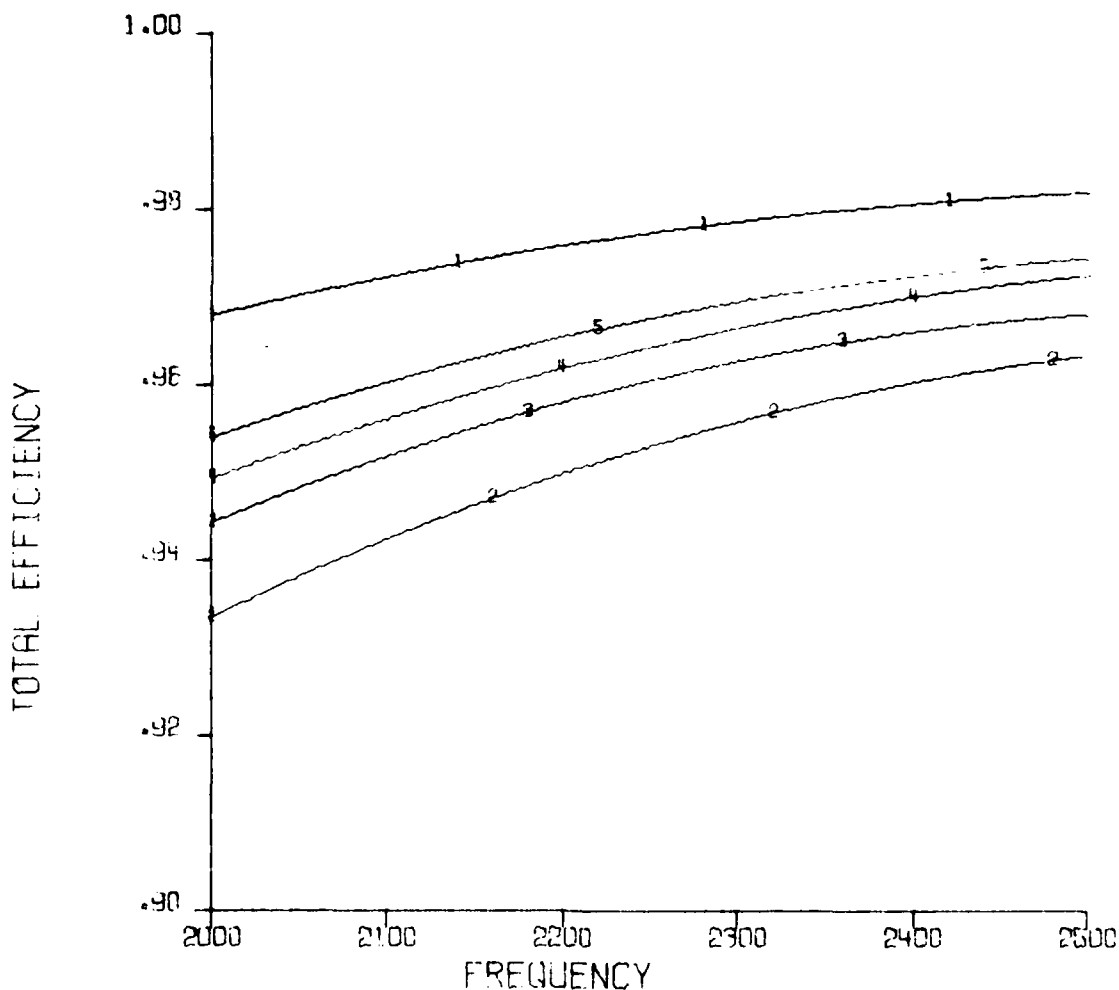
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03 -J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

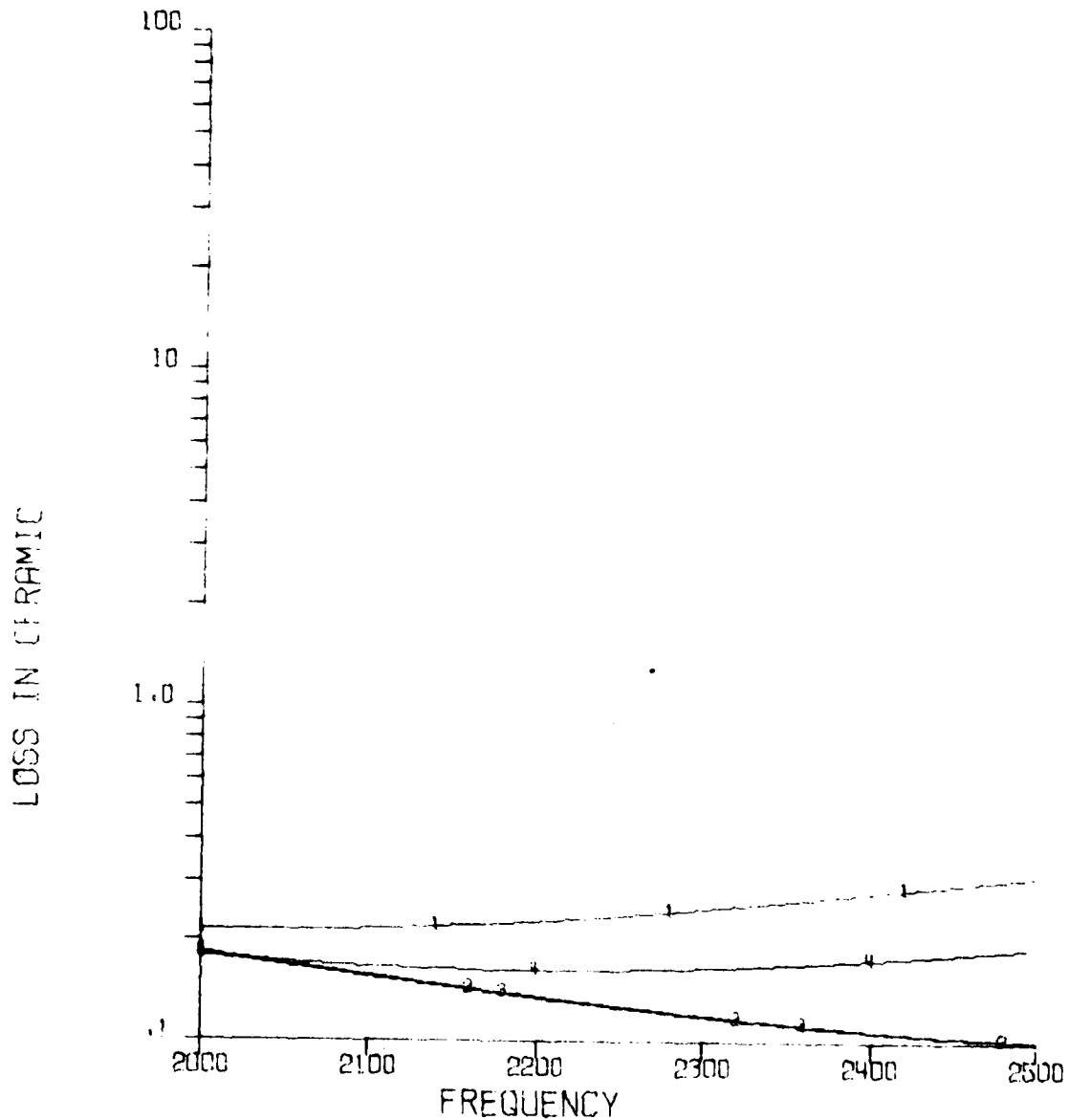
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0,90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082910E03+J3.08428731E03

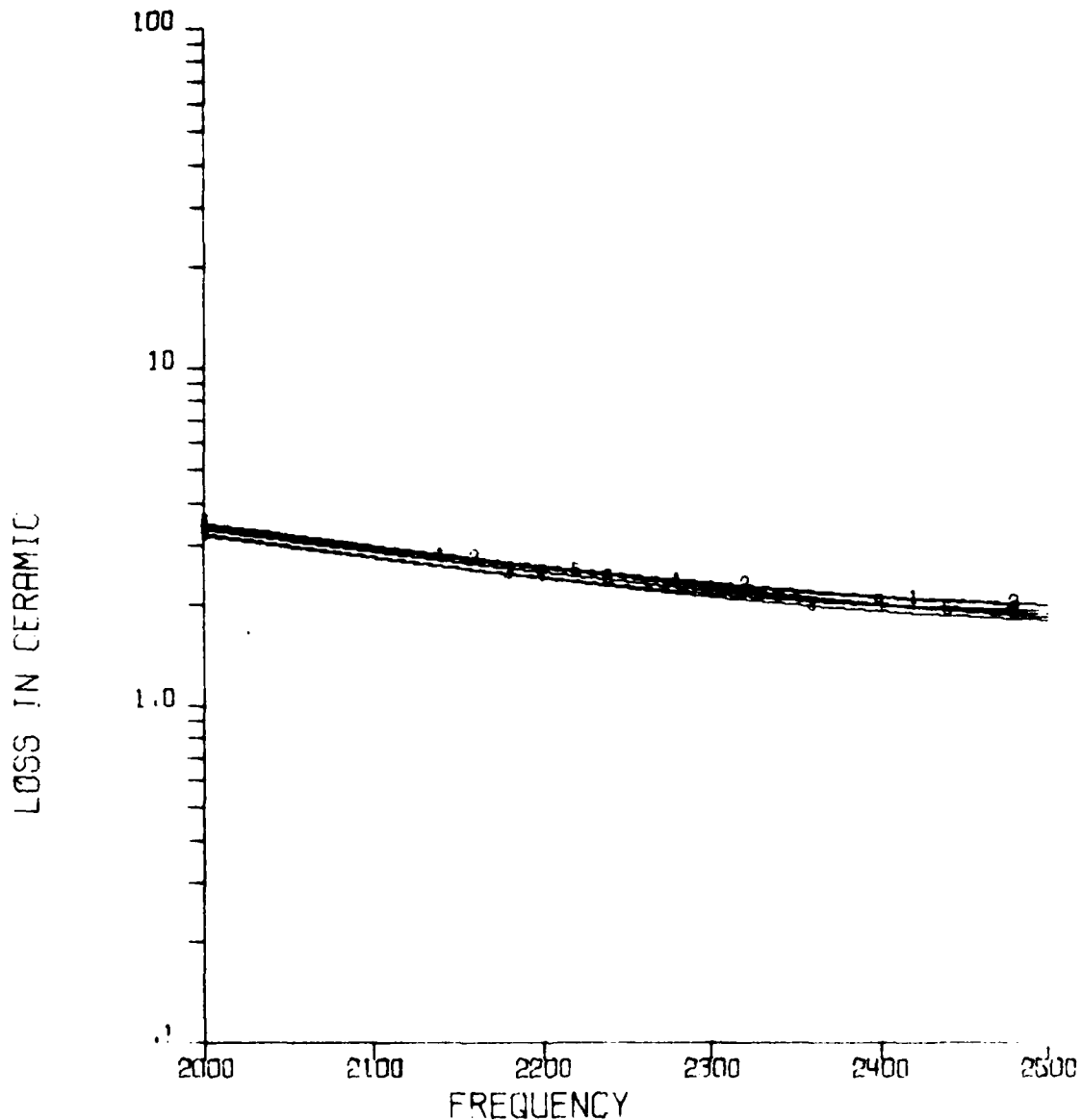
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

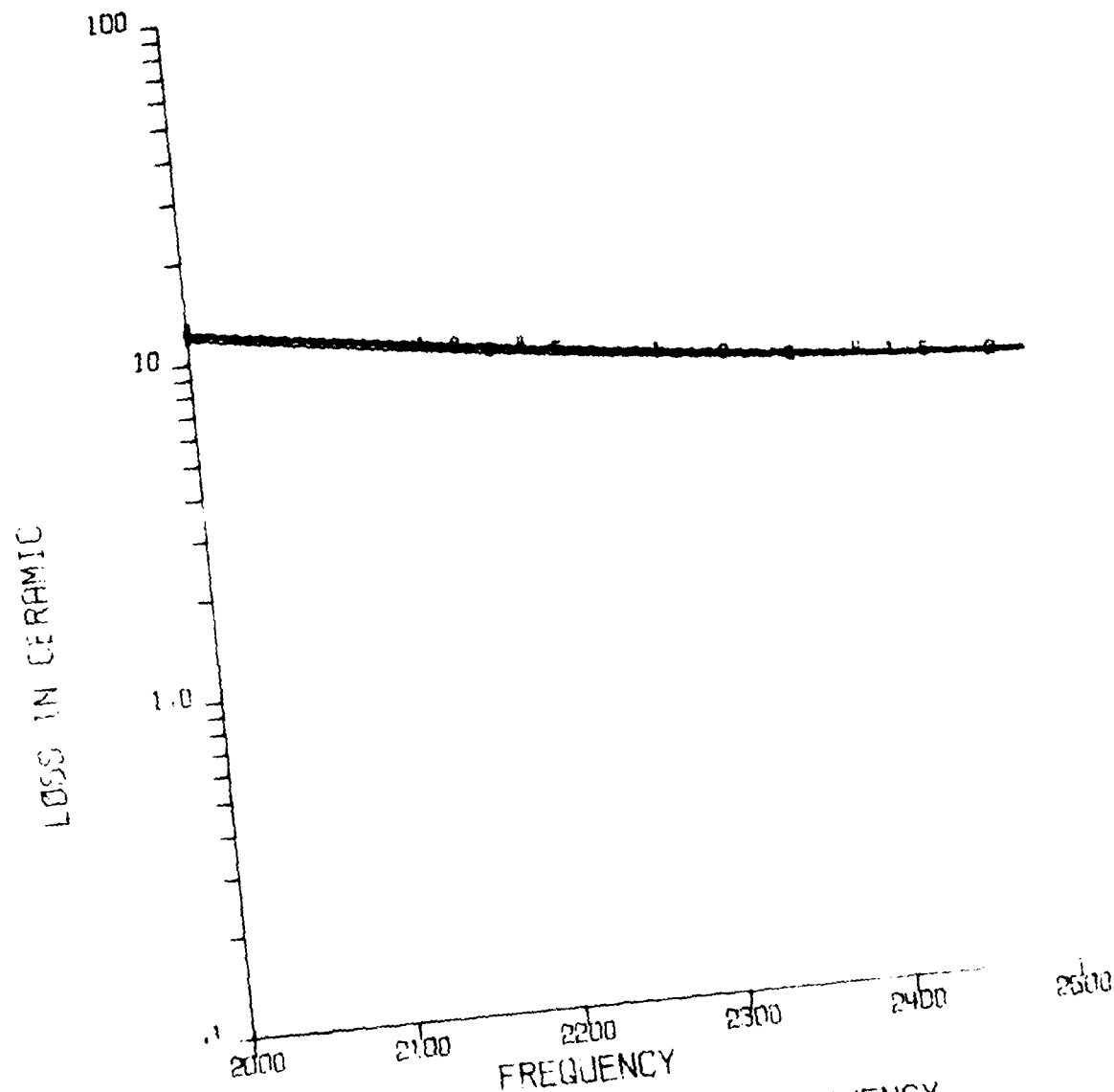
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03 -J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

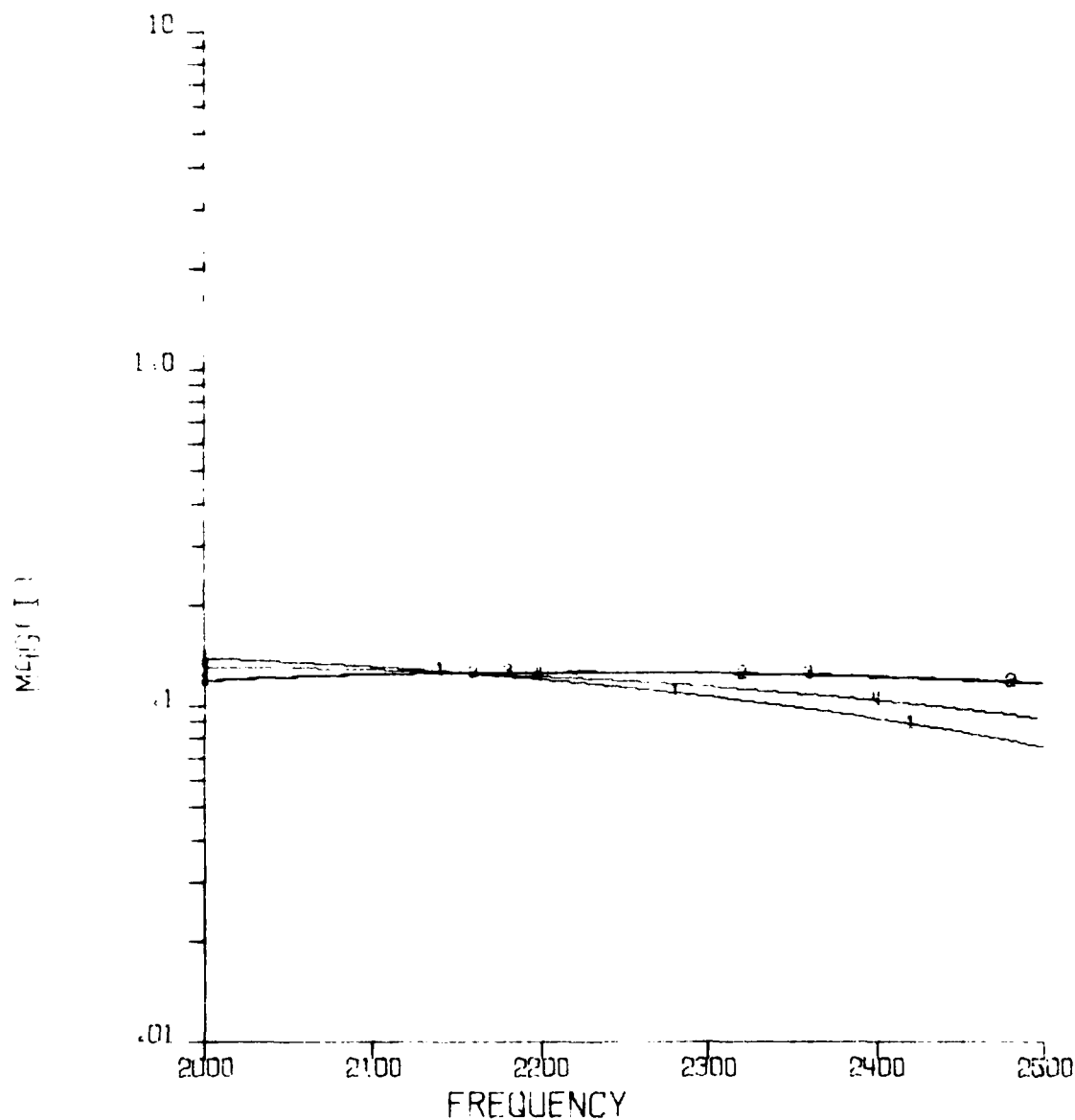
GE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES	=8.62318751E03+J3.54954775E03
CURVE 2 - MIN R	=4.04152567E03+J1.58332185E03
CURVE 3 - MAX X	=4.71313038E03+J6.22775241E03
CURVE 4 - MIN X	=5.48191309E03-J1.07796008E02
CURVE 5 - AVG	=5.92082810E03+J3.06428731E03

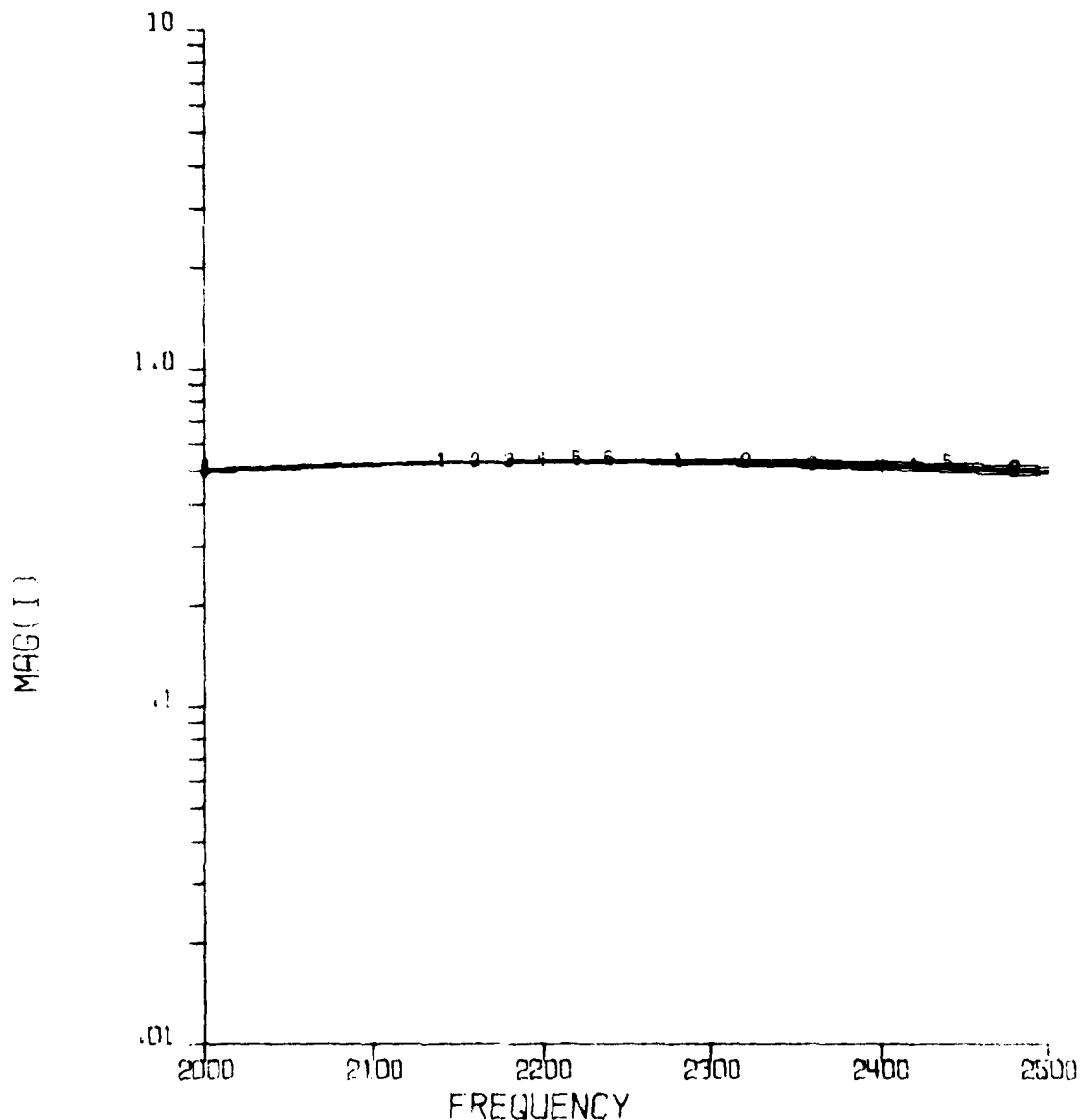
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

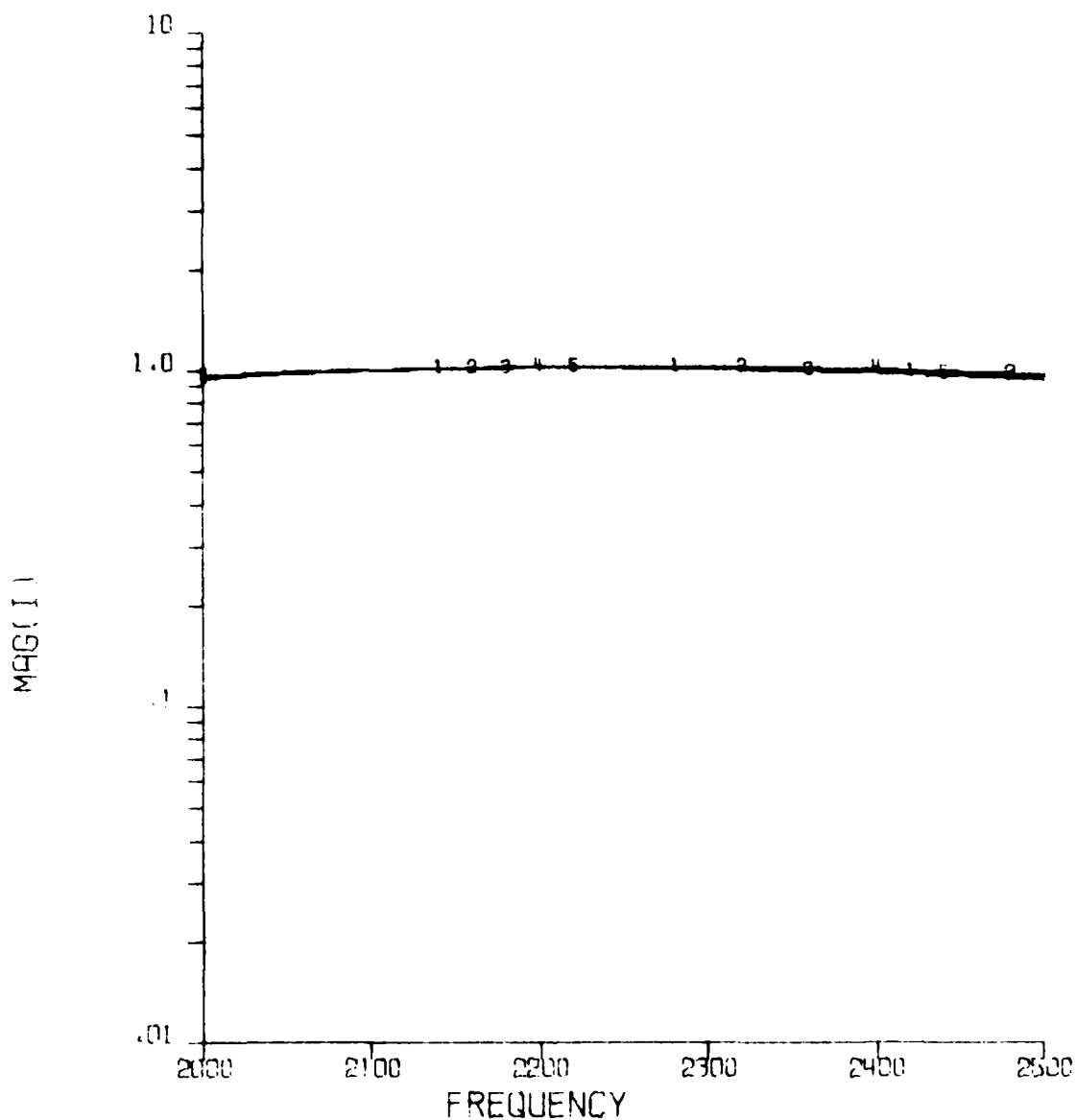
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

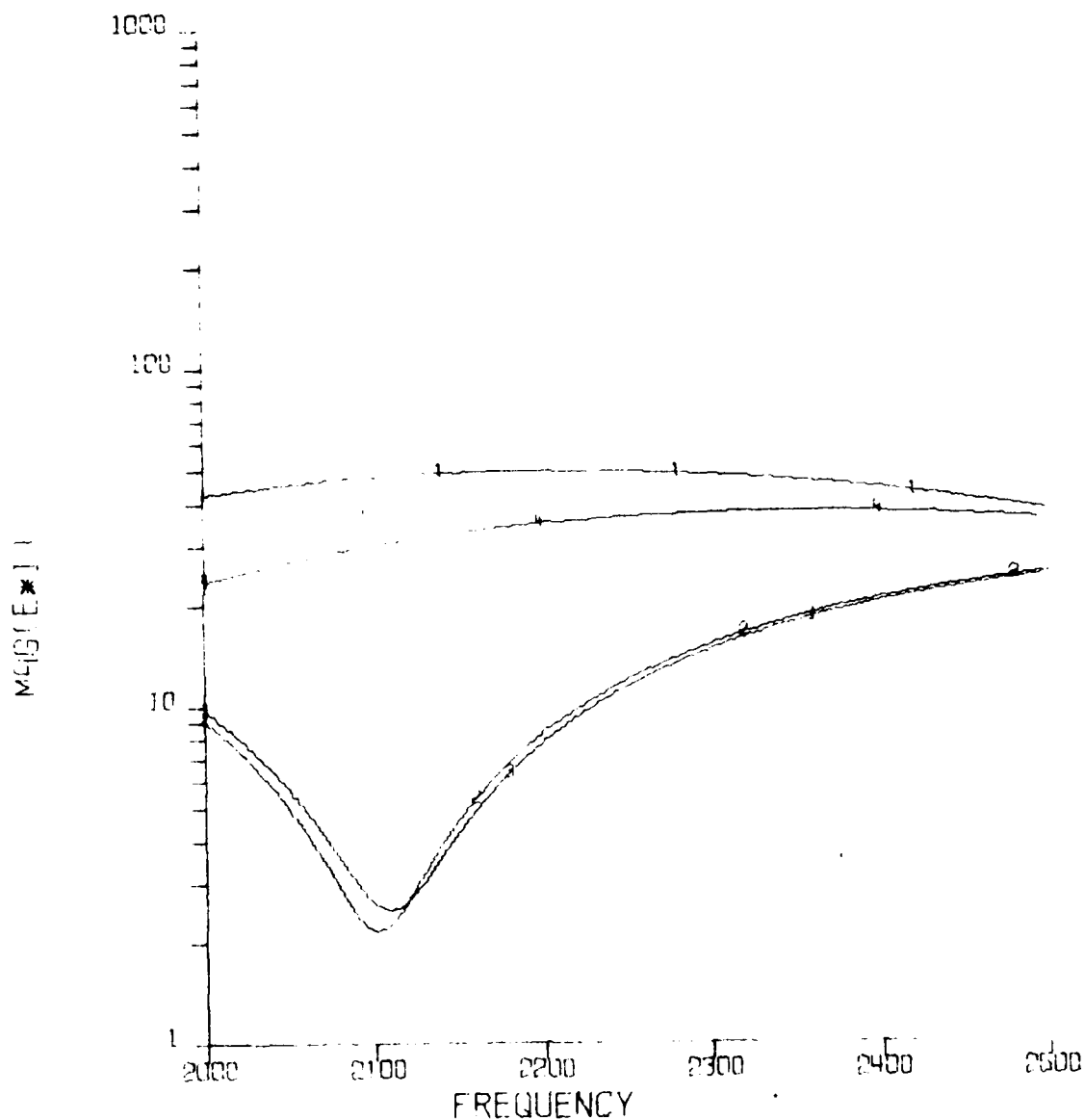
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0,90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

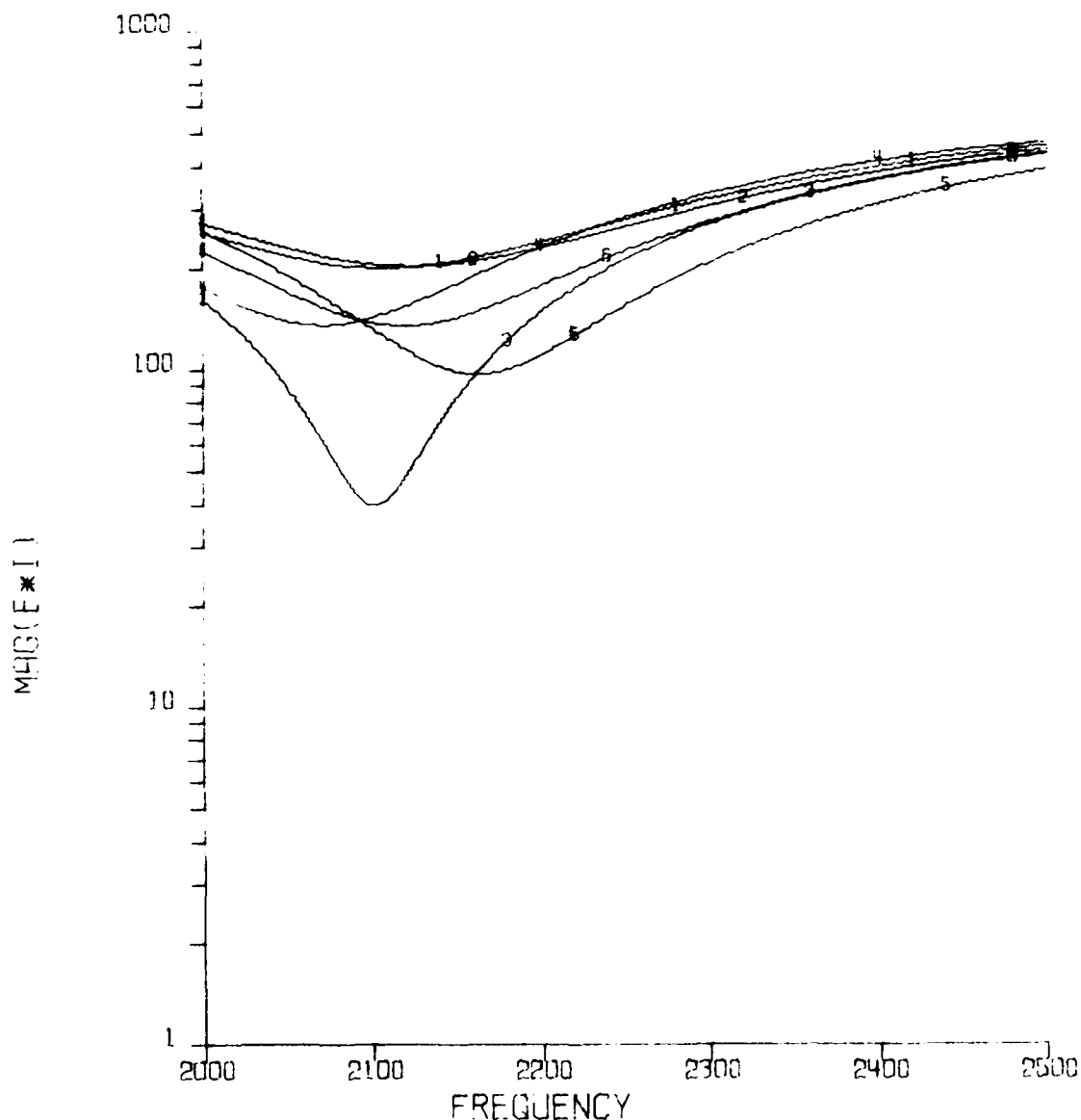
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

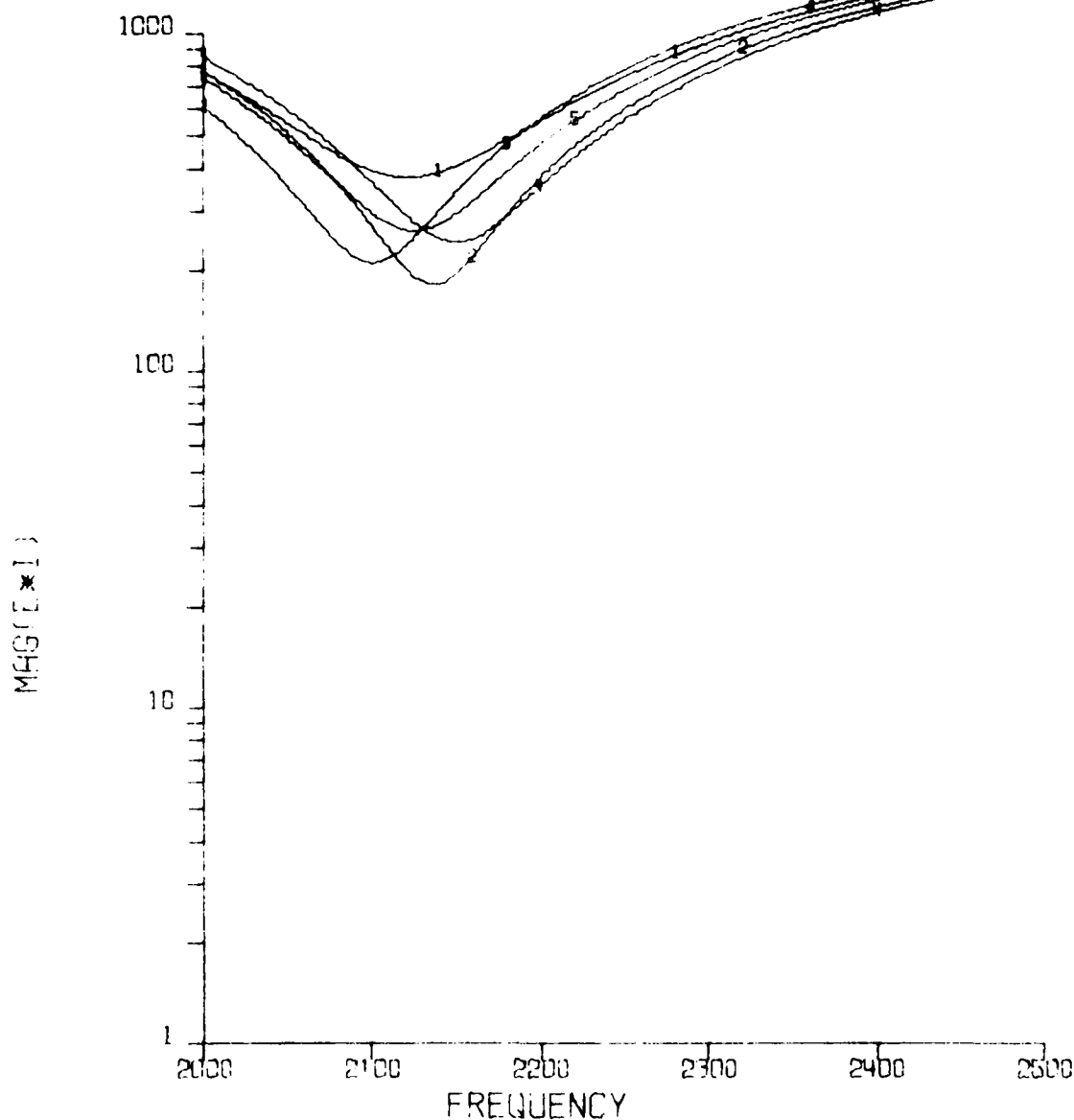
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

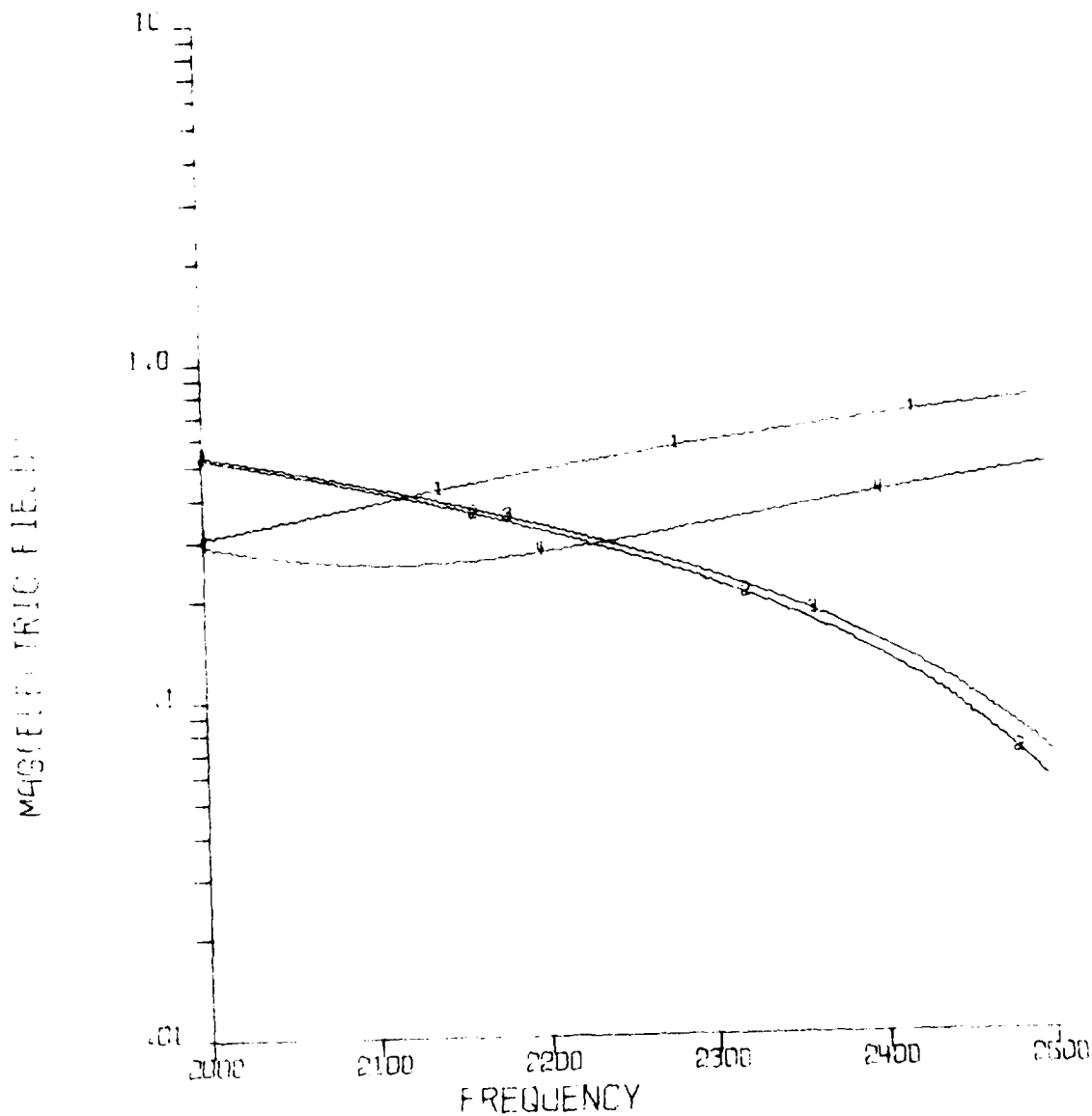
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

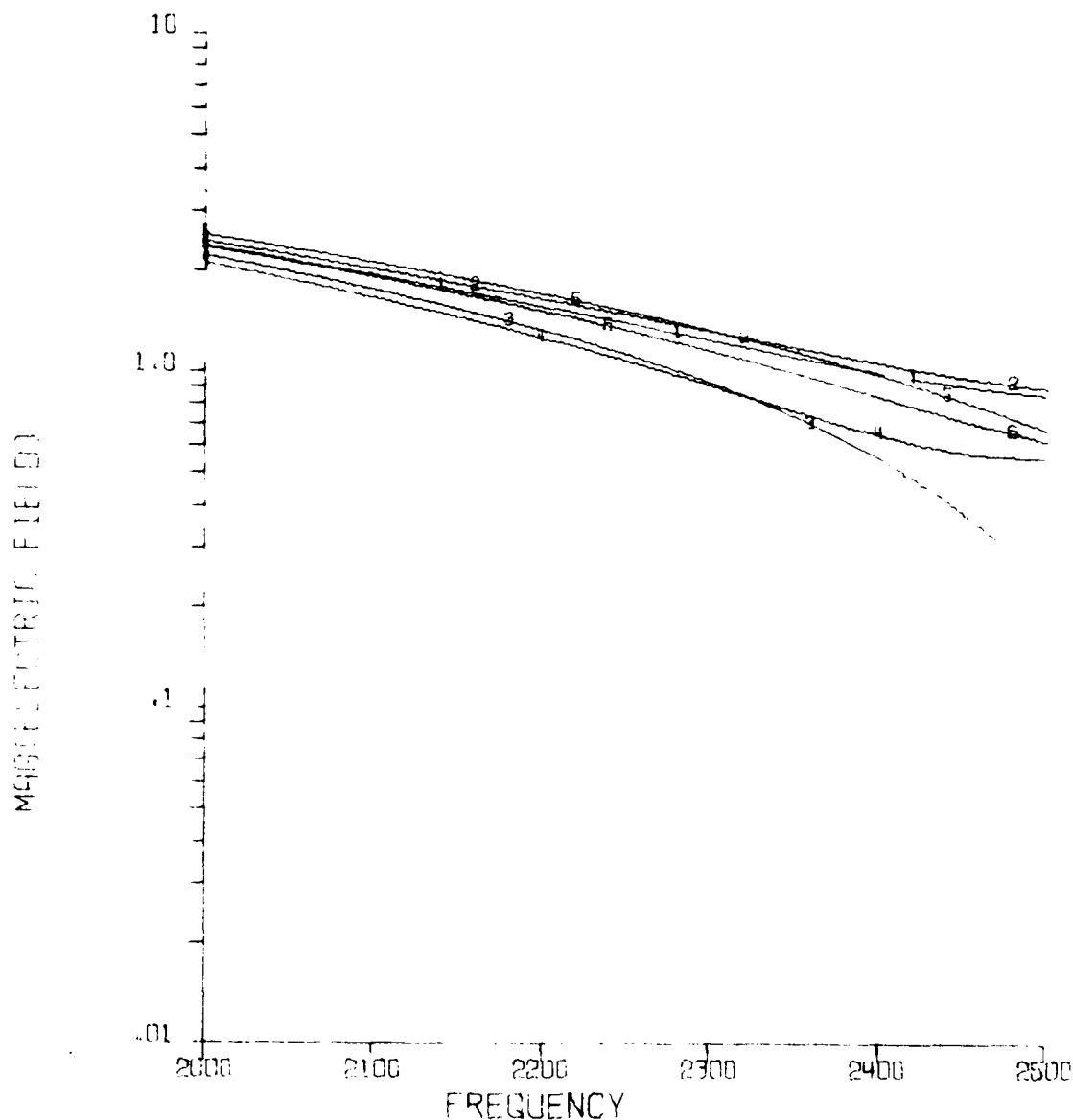
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LS=.1886 OS=E+50 LP=.3750 QP=E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

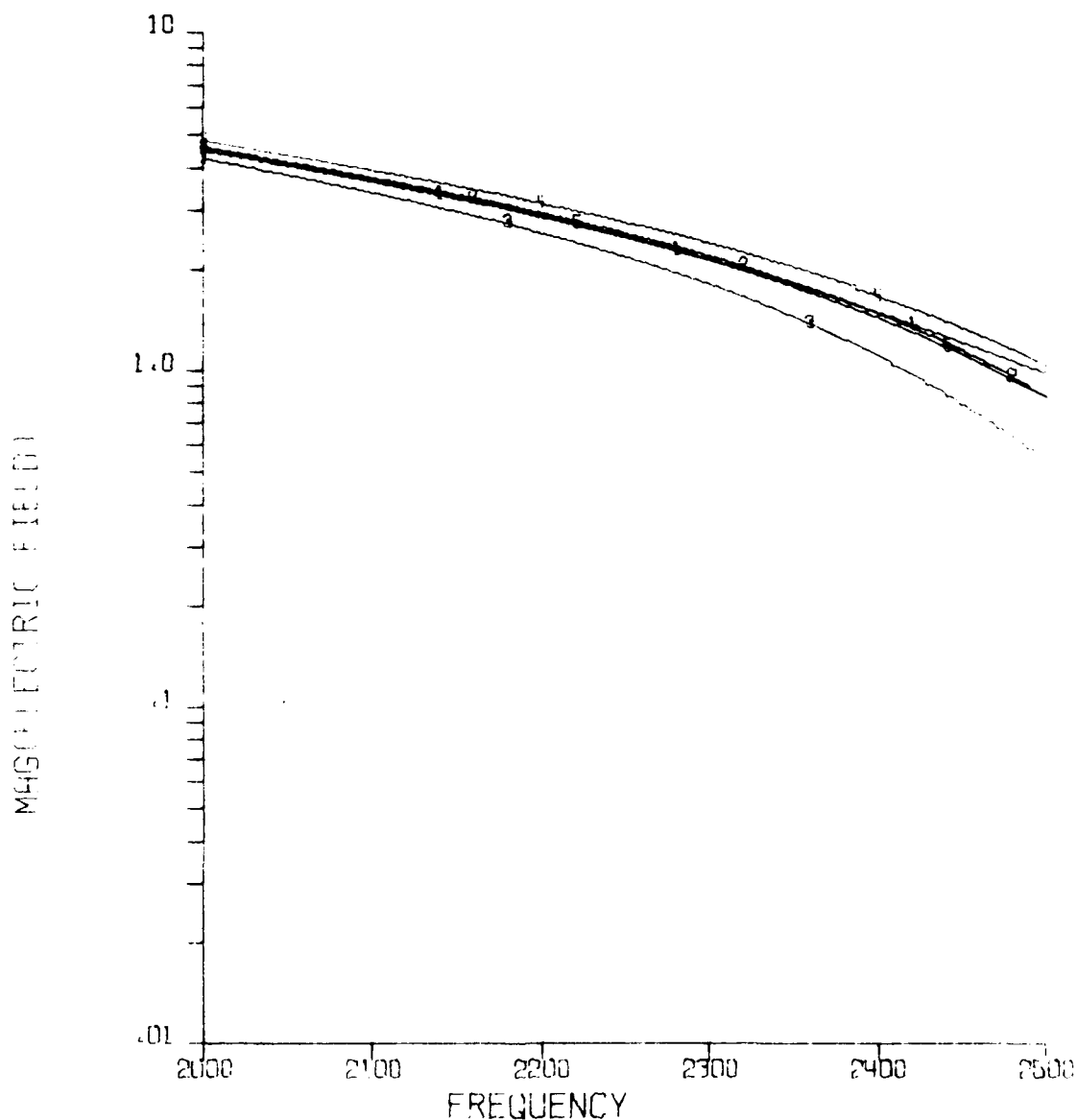
C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03+J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1886 QS=E+50 LP=.3750 QP=E+50



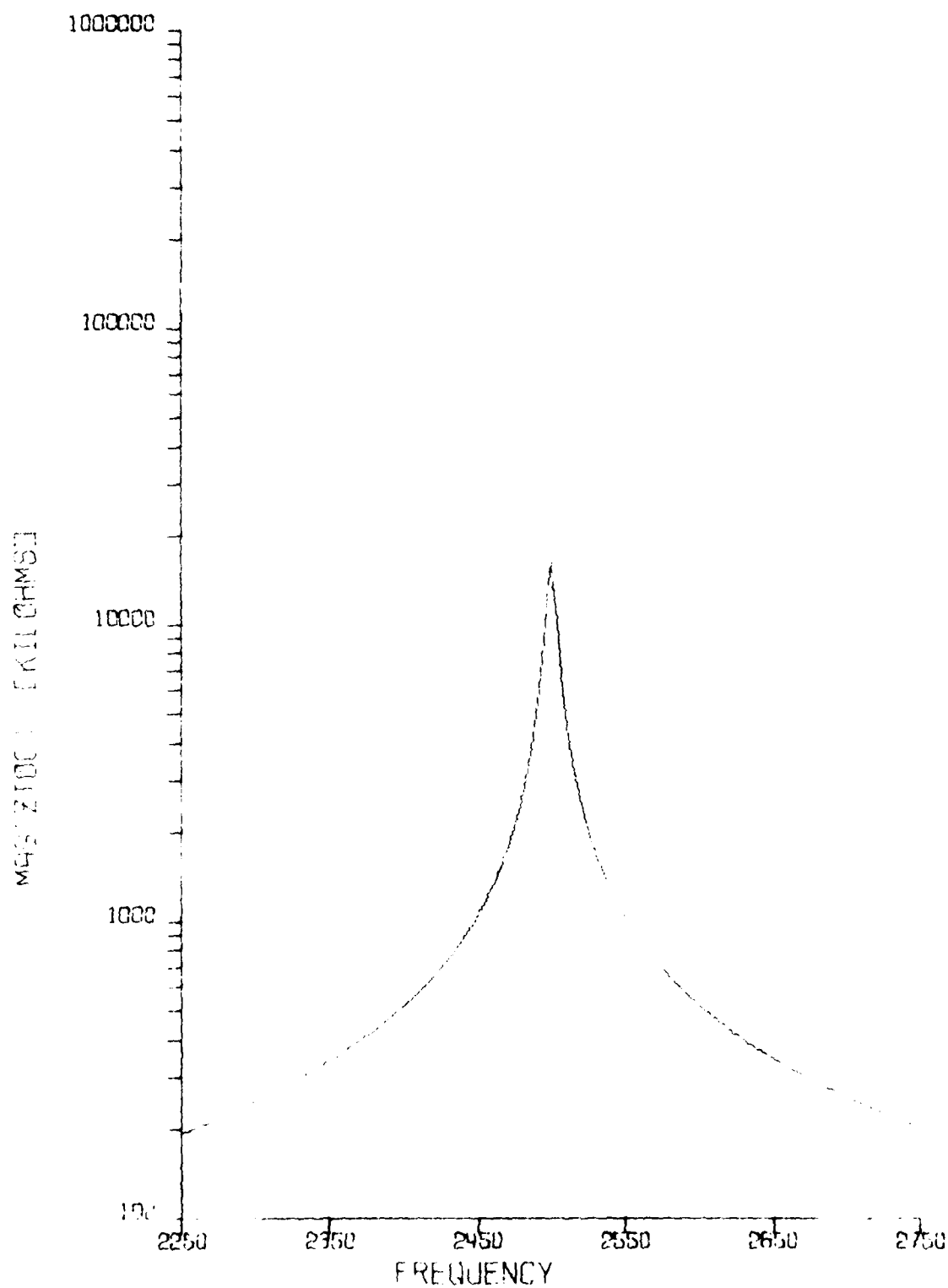
MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

TRACOR, INC.

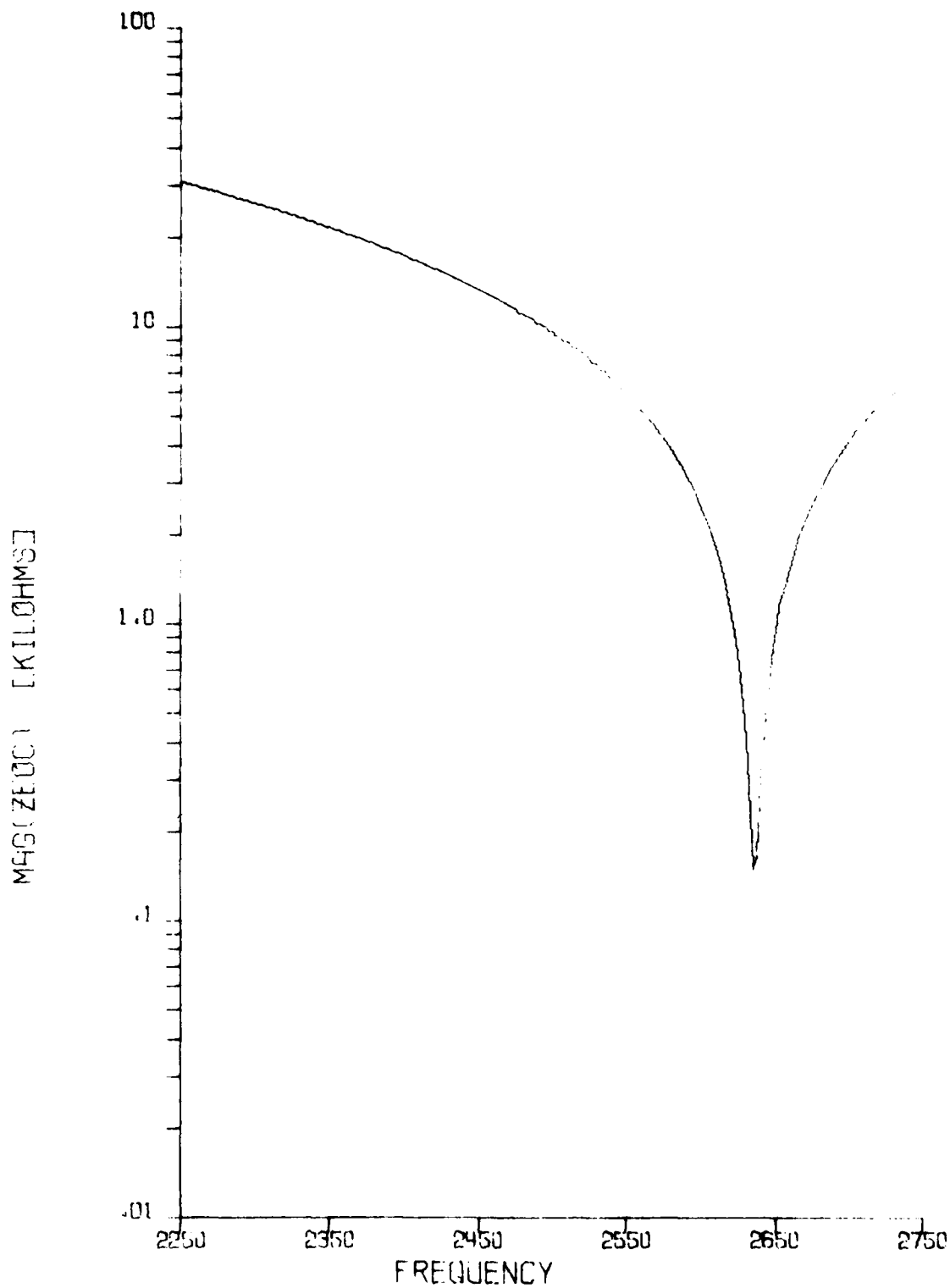
MID BAND

DE CONTIGAD 1
C.P. 1 5 INCH CIRCULAR HEAD
MID BAND
LP=.3777 QP=E+50



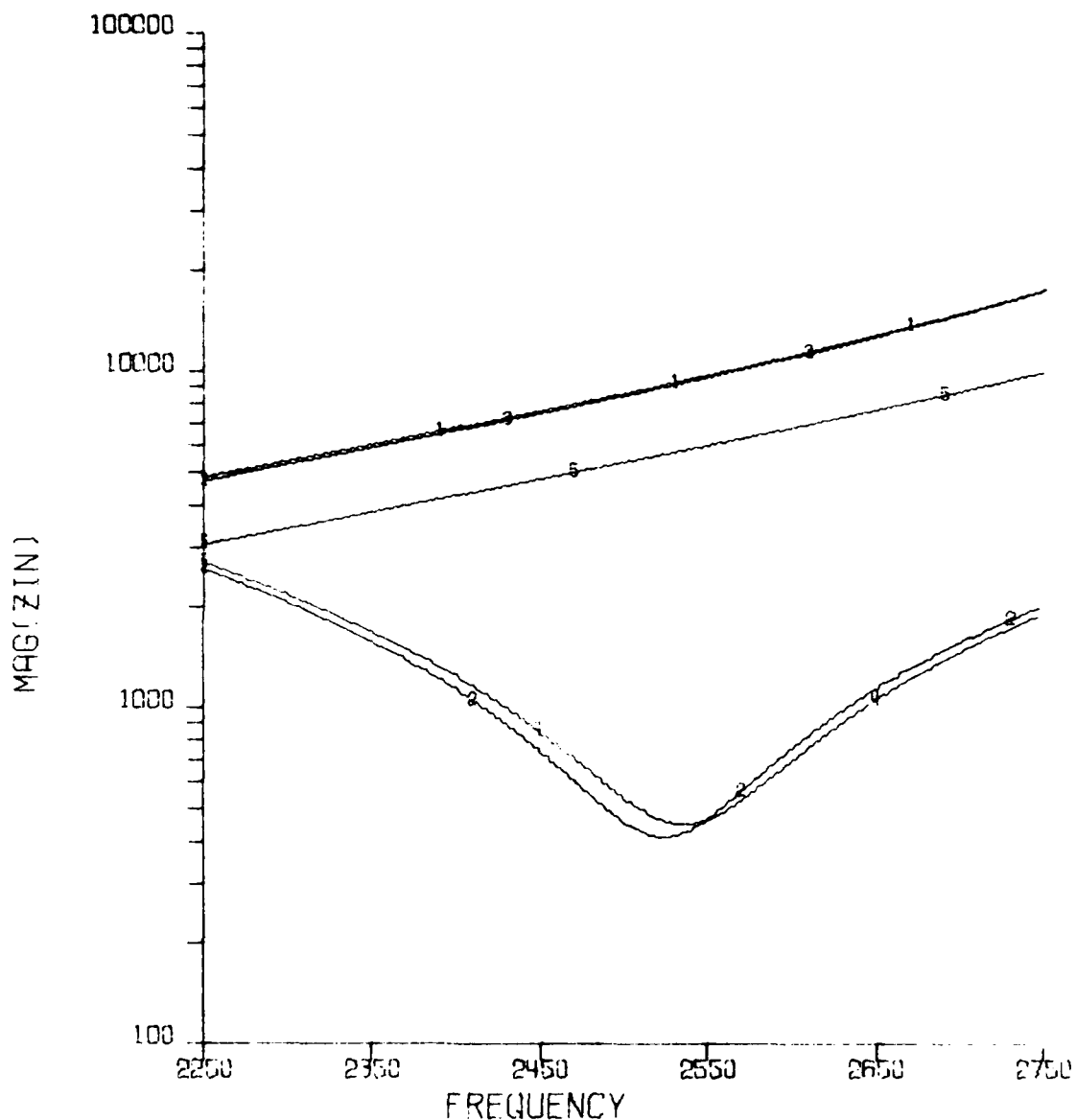
MAG(Z100) VERSUS FREQUENCY

GE DUMILORD I
C.P. 1 5 INCH CIRCULAR HEAD
MID BAND
LP=.3777 QP=E+50



MAG(ZE.OO) VERSUS FREQUENCY

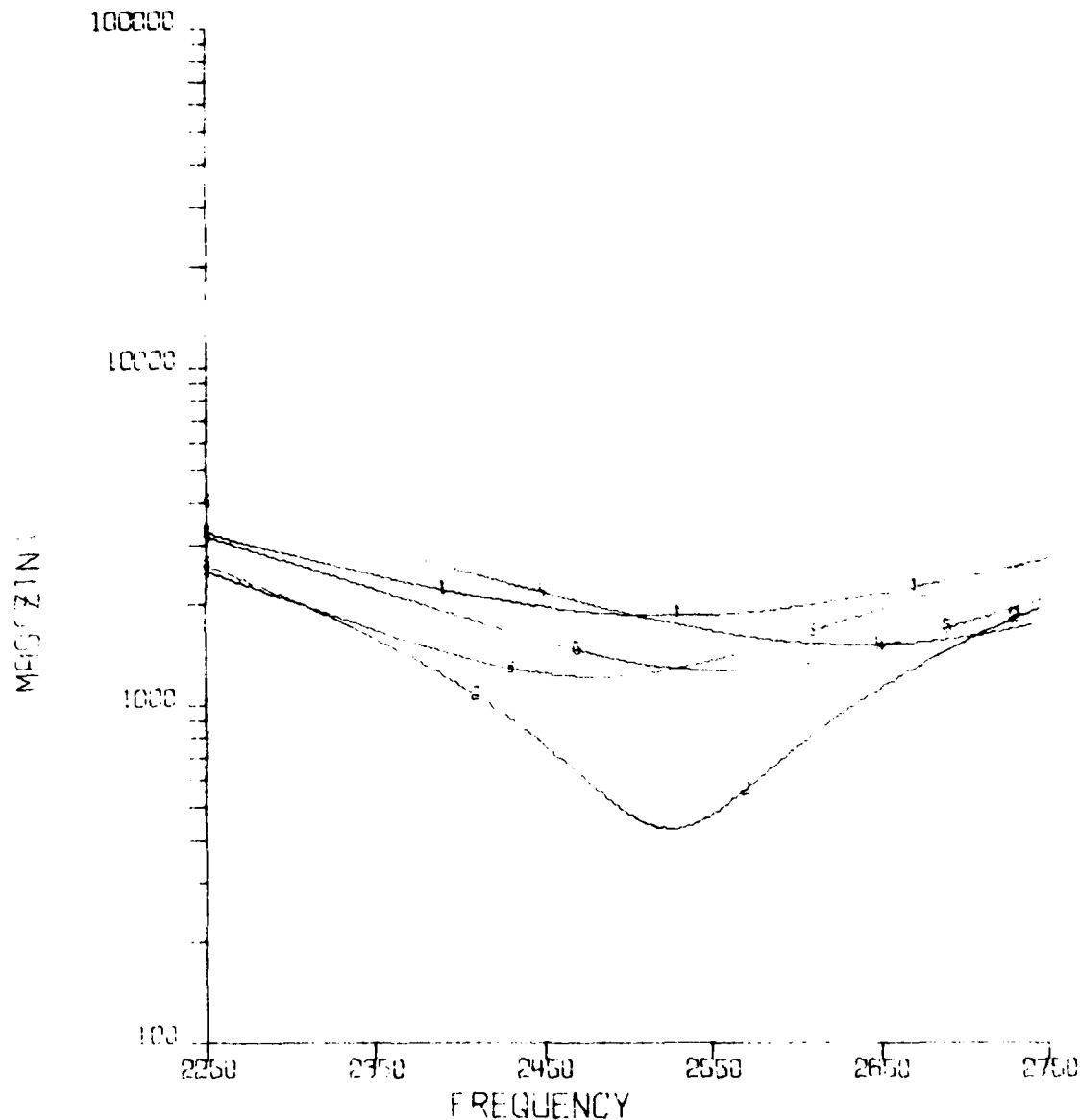
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3777 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

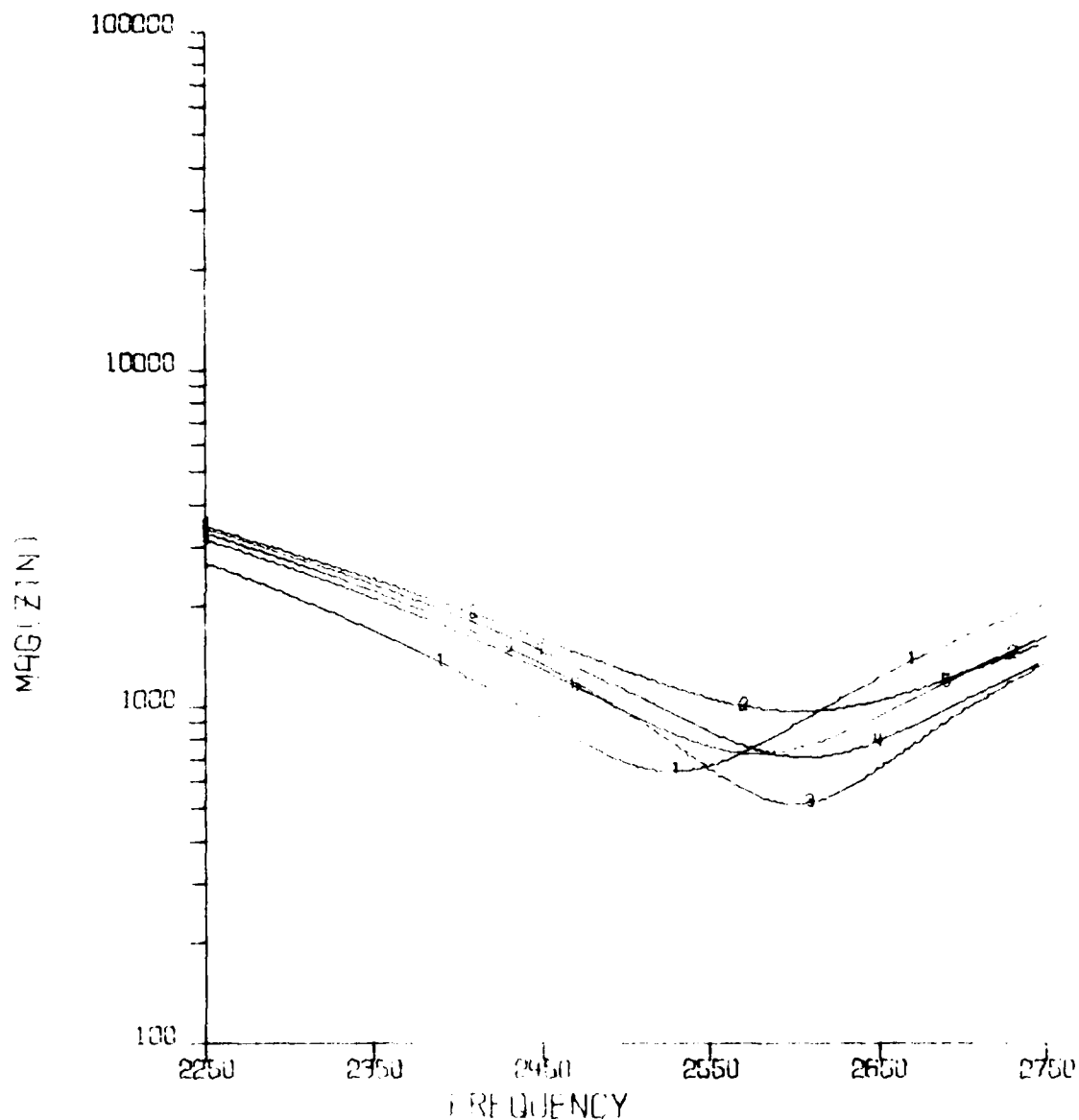
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3777 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93821119E03

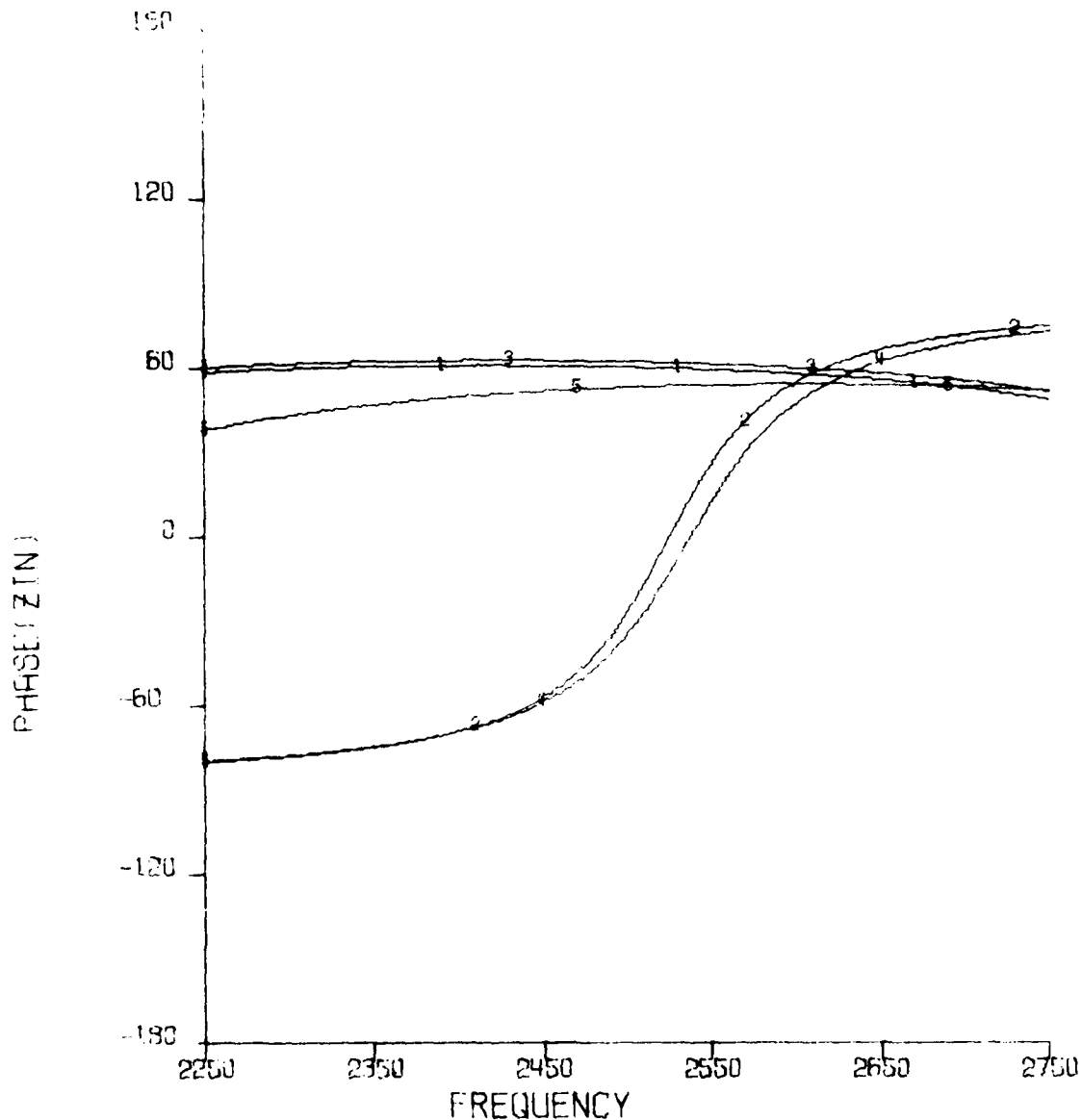
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0,90)
 LP=.3777 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R .8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R -4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X -5.94411695E03+J1.82753326E03
 CURVE 5 - AVG 6.13526911E03+J3.81425445E03

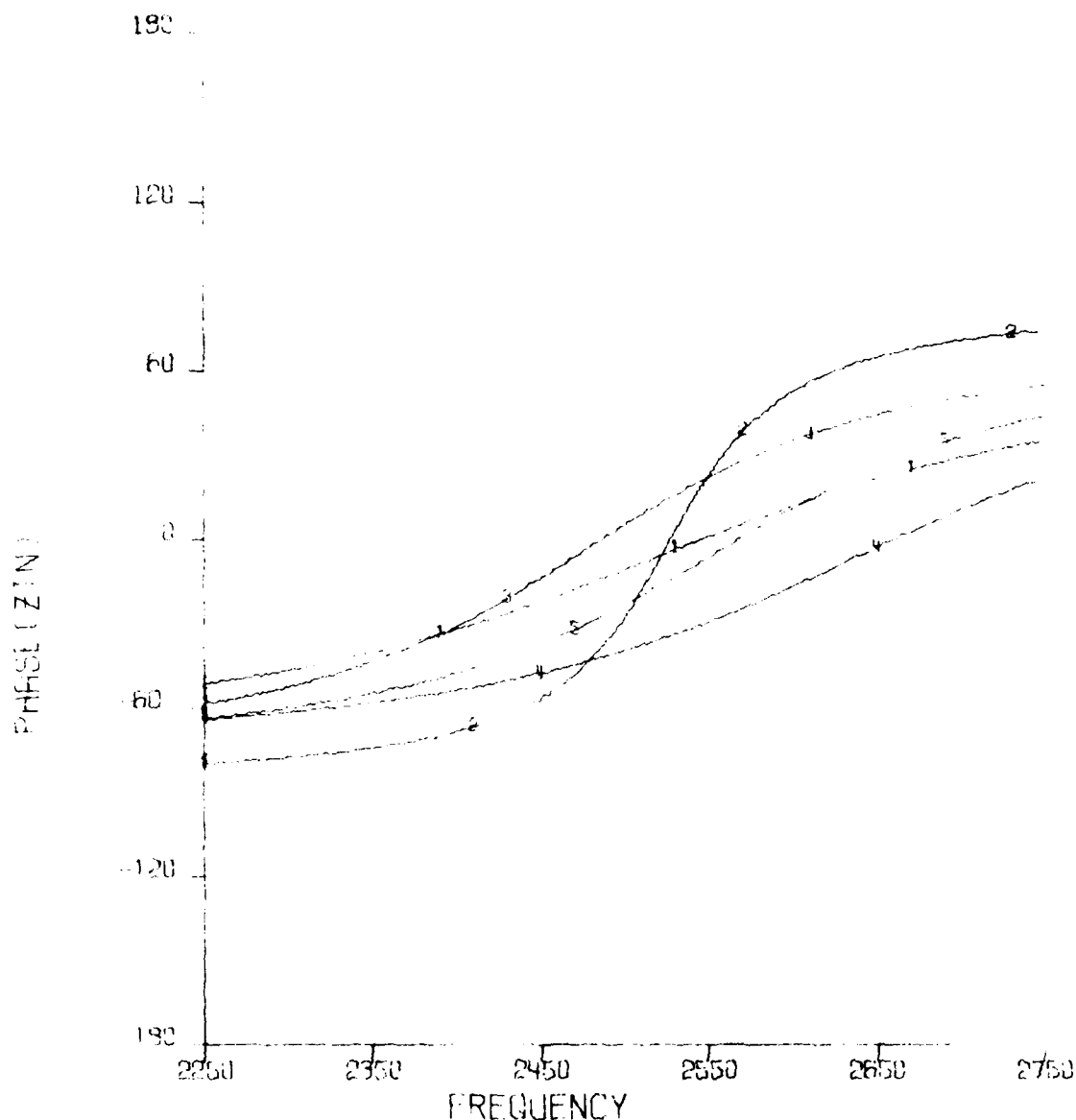
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3777 QP=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

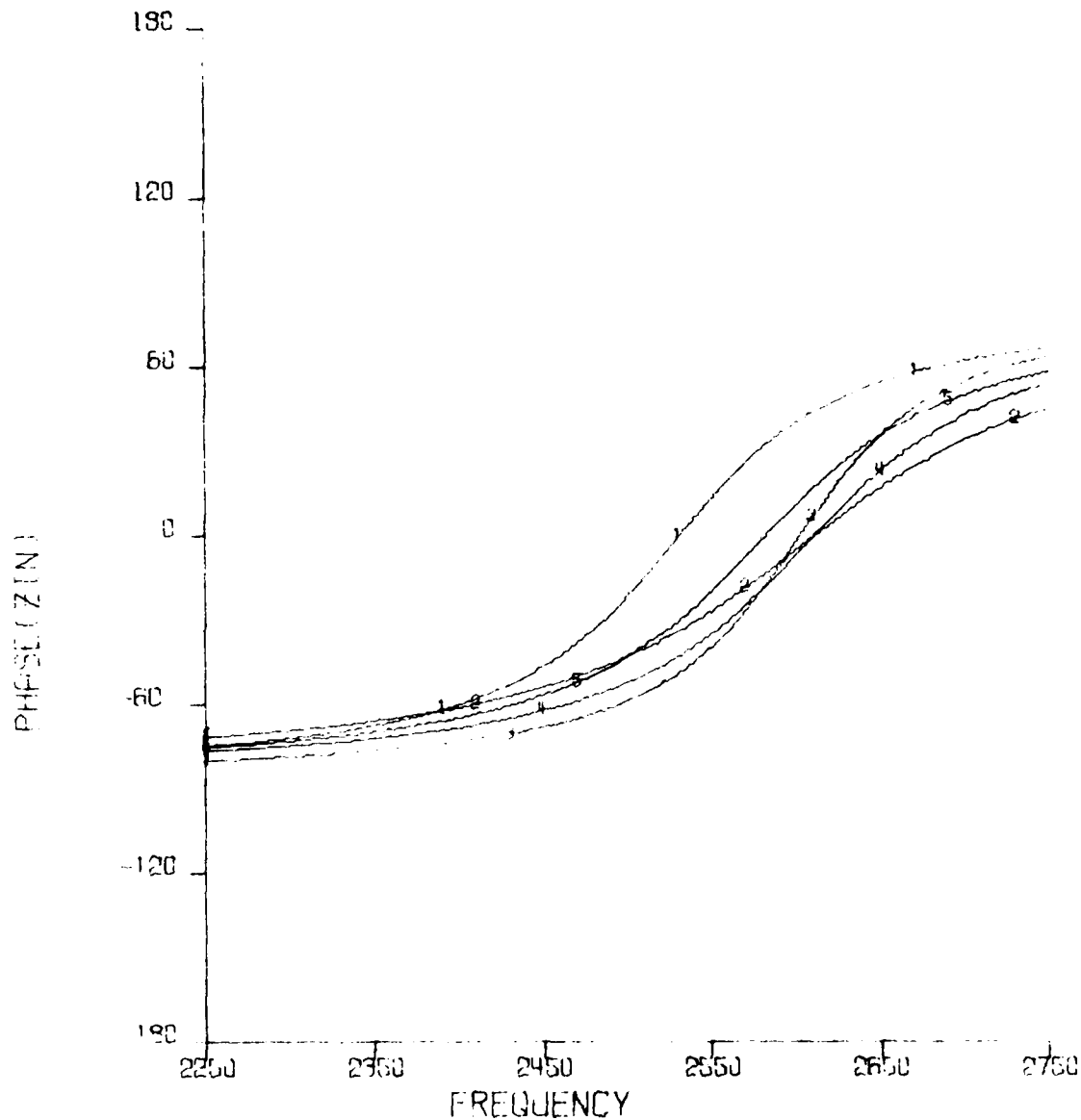
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3777 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.29174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

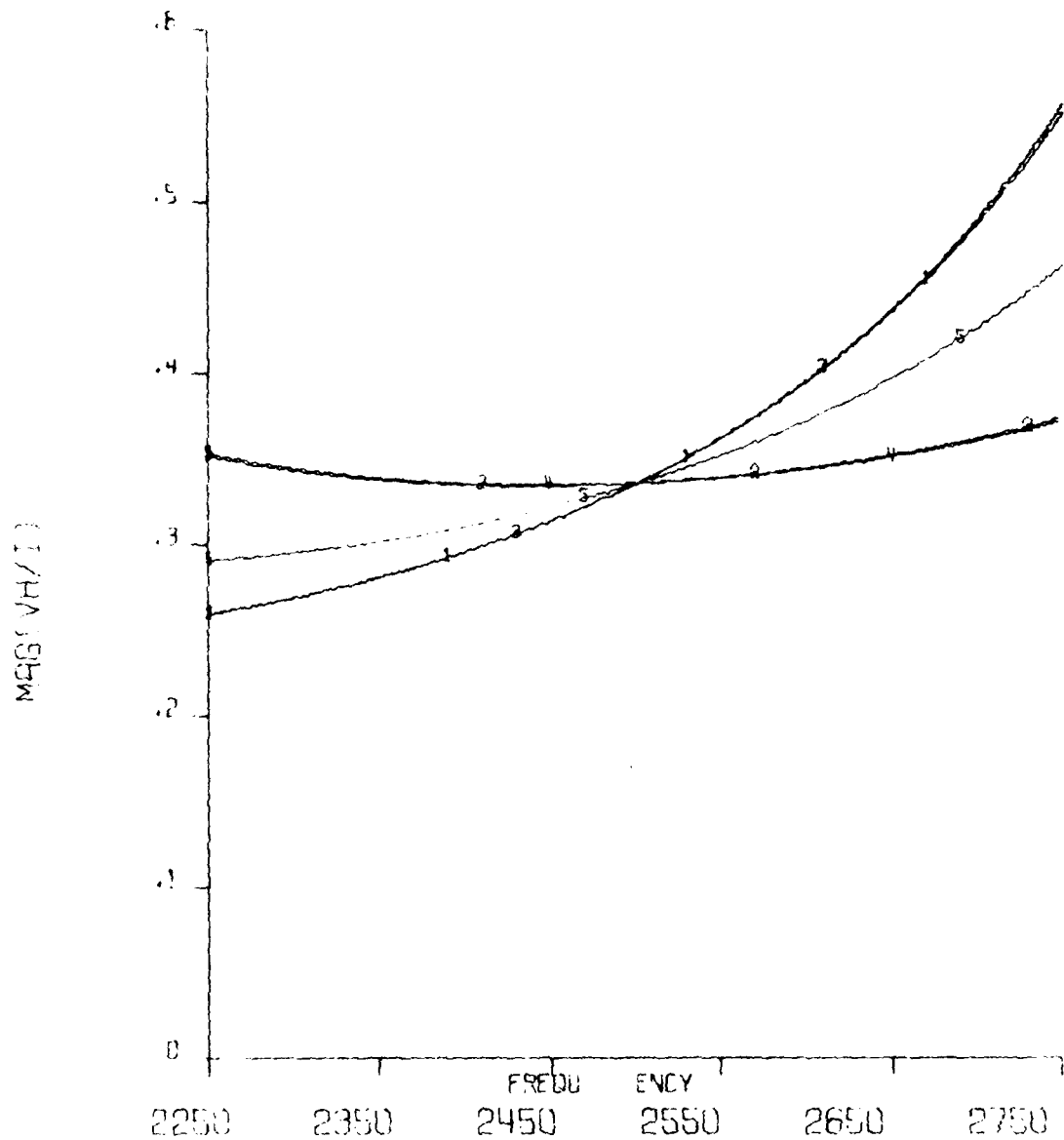
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3777 QP=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1	- MAX	PRES	=5.50801644E03+J7.43469919E03
CURVE 2	- MAX	R	=8.18015867E03+J1.90754574E03
CURVE 3	- MIN	R	=4.27851865E03+J2.38239074E03
CURVE 4	- MIN	X	=5.94411695E03+J1.82753326E03
CURVE 5	- AVG		=6.13526911E03+J3.81425445E03

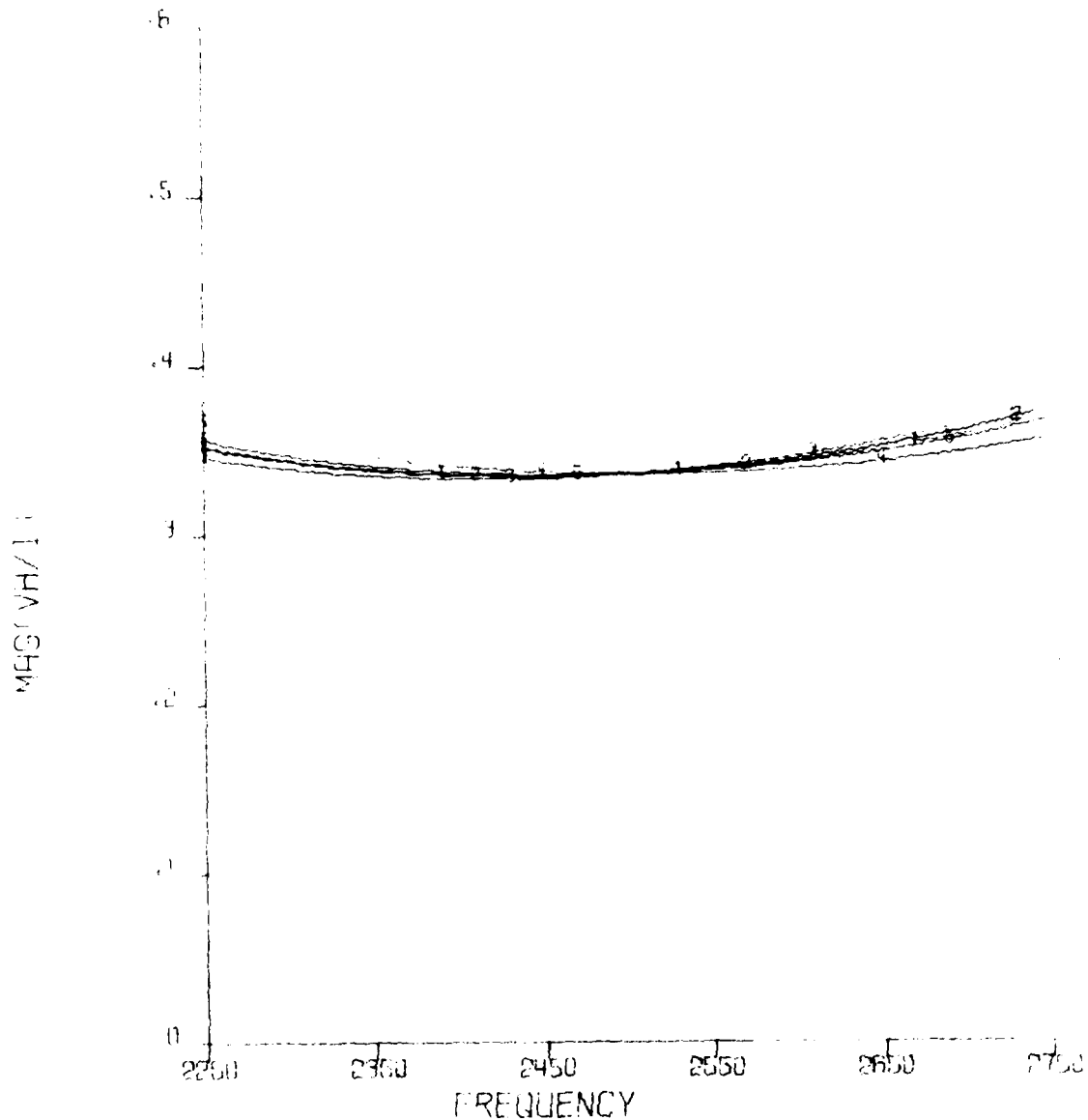
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3777 GP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512488E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

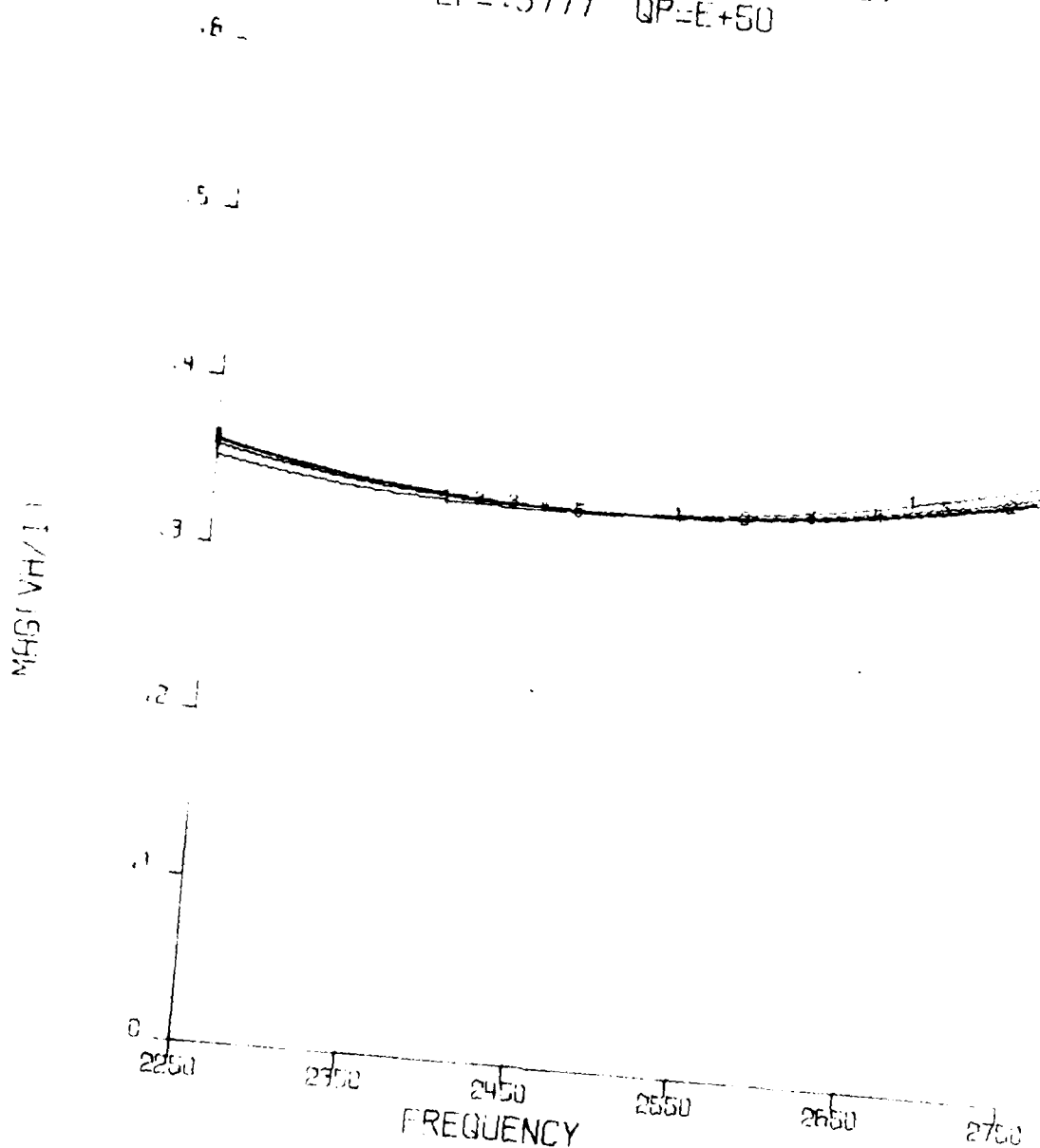
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3777 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.35386351E02
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

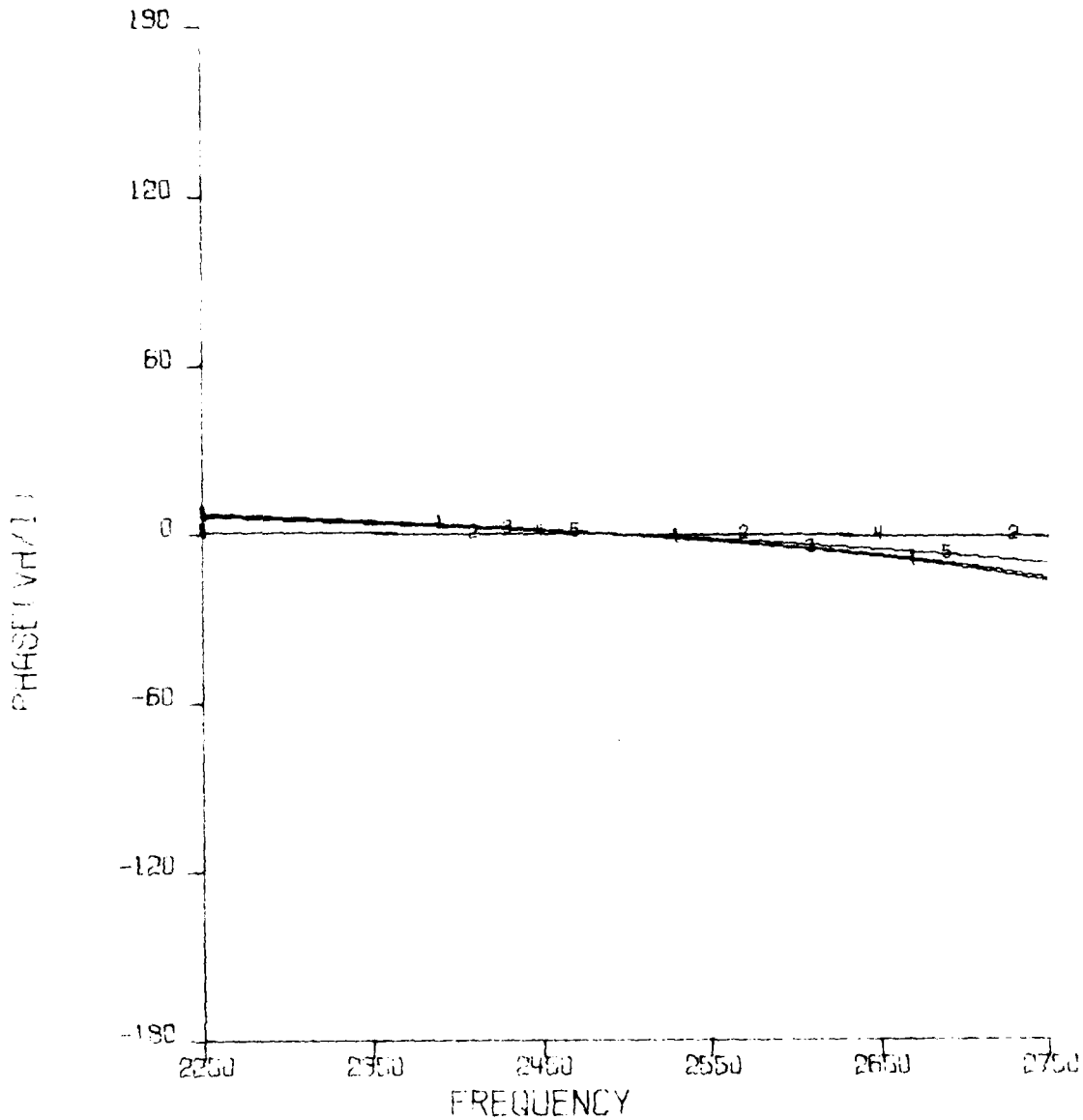
GE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3777 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES	=5.50801644E03+J7.43469919E03
CURVE 2 - MAX R	=8.18015867E03+J1.90754574E03
CURVE 3 - MIN R	=4.27851865E03+J2.39239074E03
CURVE 4 - MIN X	=5.94411695E03+J1.82753326E03
CURVE 5 - AVG	=6.13526911E03+J3.81425445E03

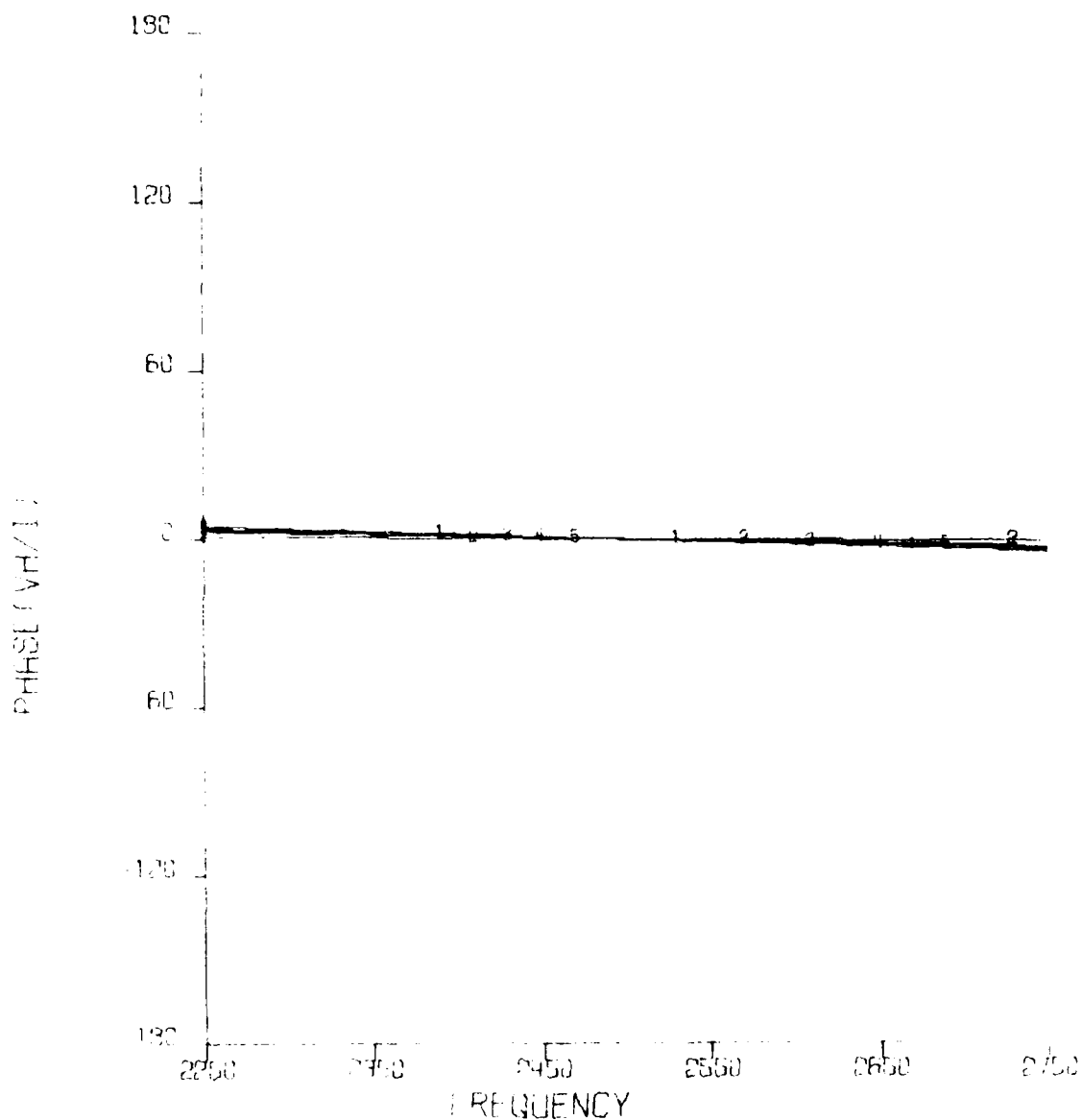
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3777 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81586841E04+J4.83015054E04

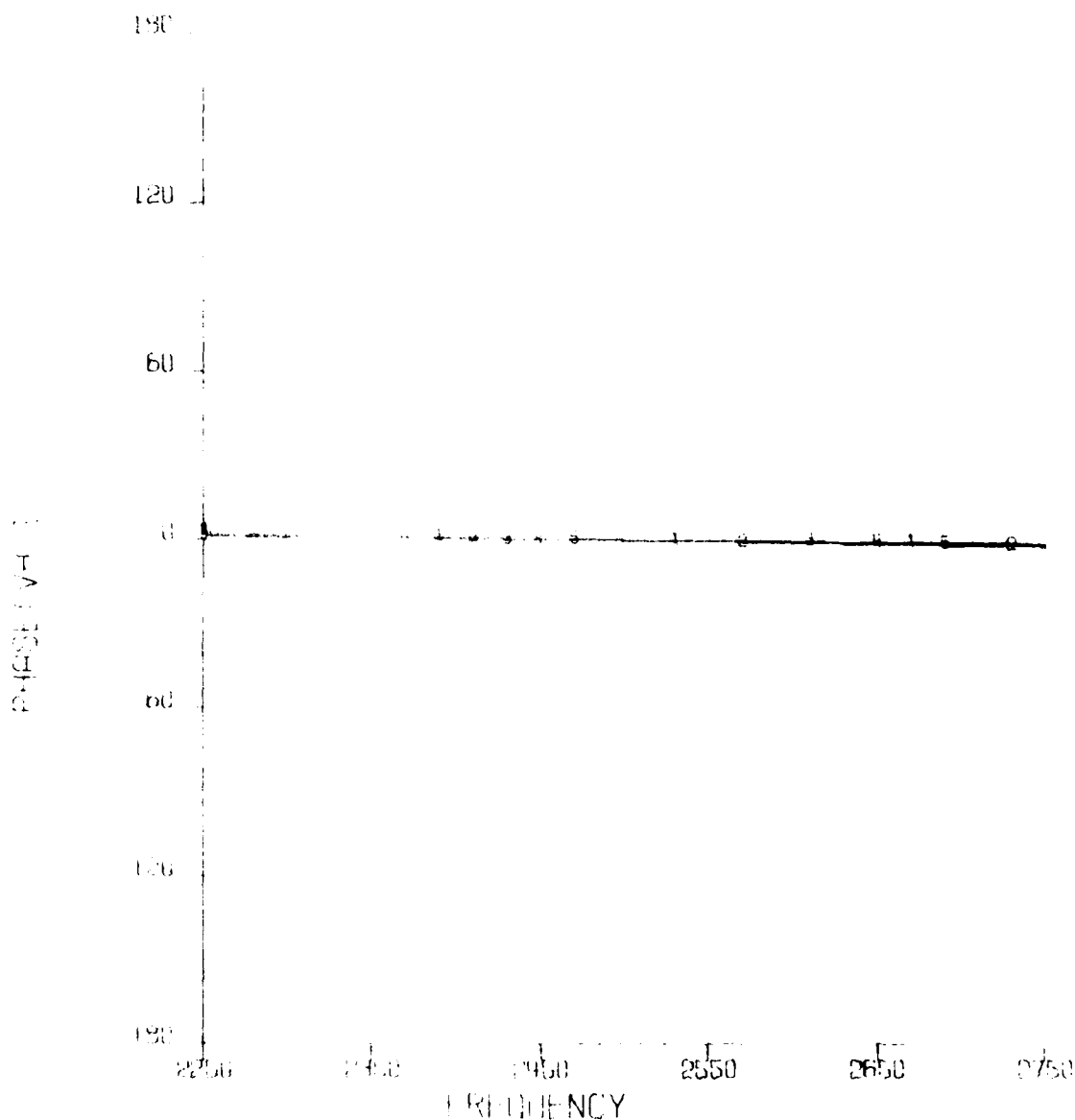
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3777 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R 3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X 1.07609438E04+J1.06858049E04
 CURVE 4 - MIN X 1.28174594E04-J9.95396351E02
 CURVE 5 - AVG 1.09357691E04+J4.93621119E03

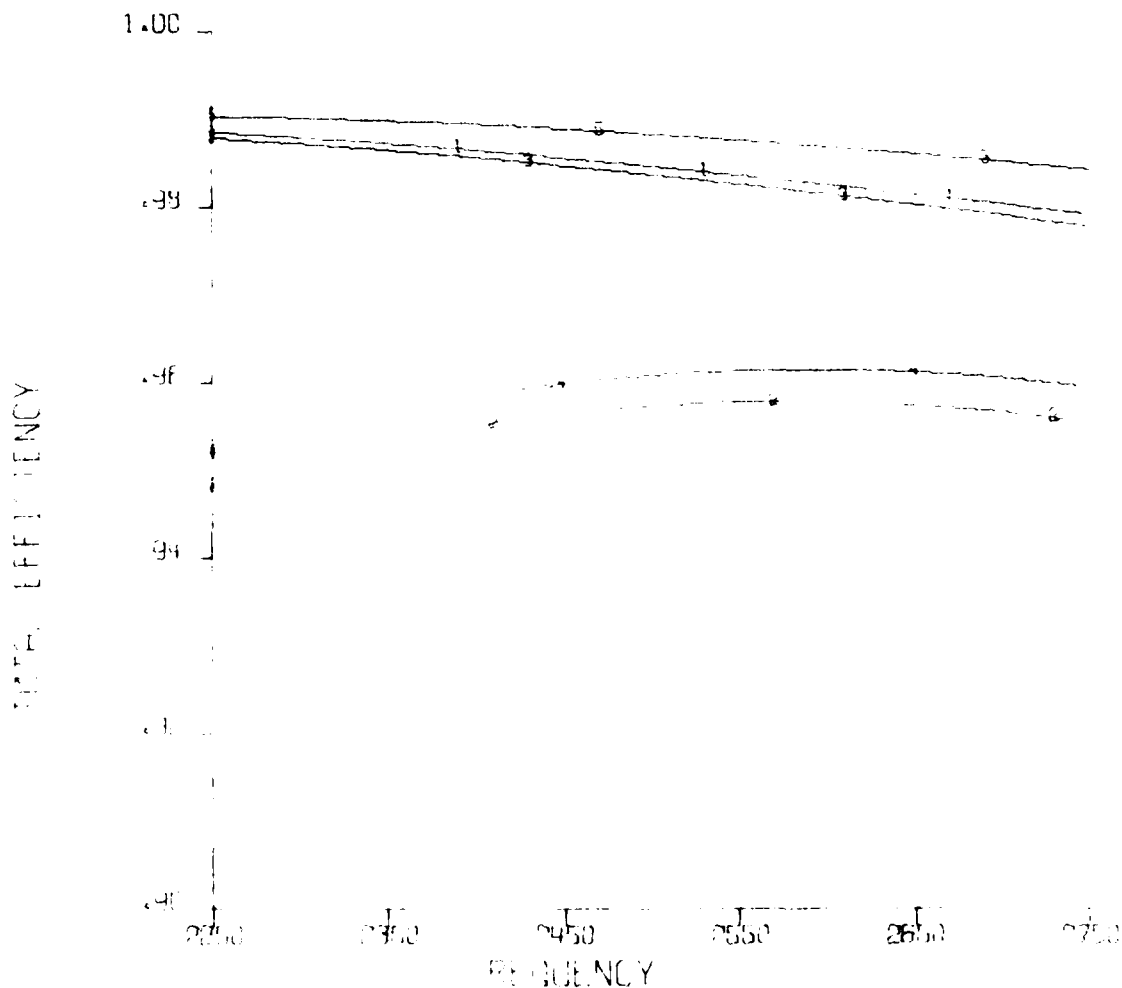
GE HUMLOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 1P-3/77 QP=E+50



Phase (deg) VERSUS FREQUENCY

CURVE 1	MAX FREQ	5.50801644E03+J7.43469919E03
CURVE 1	MAX R	8.18015867E03+J1.90784574E03
CURVE 3	MIN R	4.27851865E03+J2.38239074E03
CURVE 4	MIN X	5.34411695E03+J1.82753326E03
CURVE 1	AVG	1.613526911E03+J3.81425445E03

GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.3777 QP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

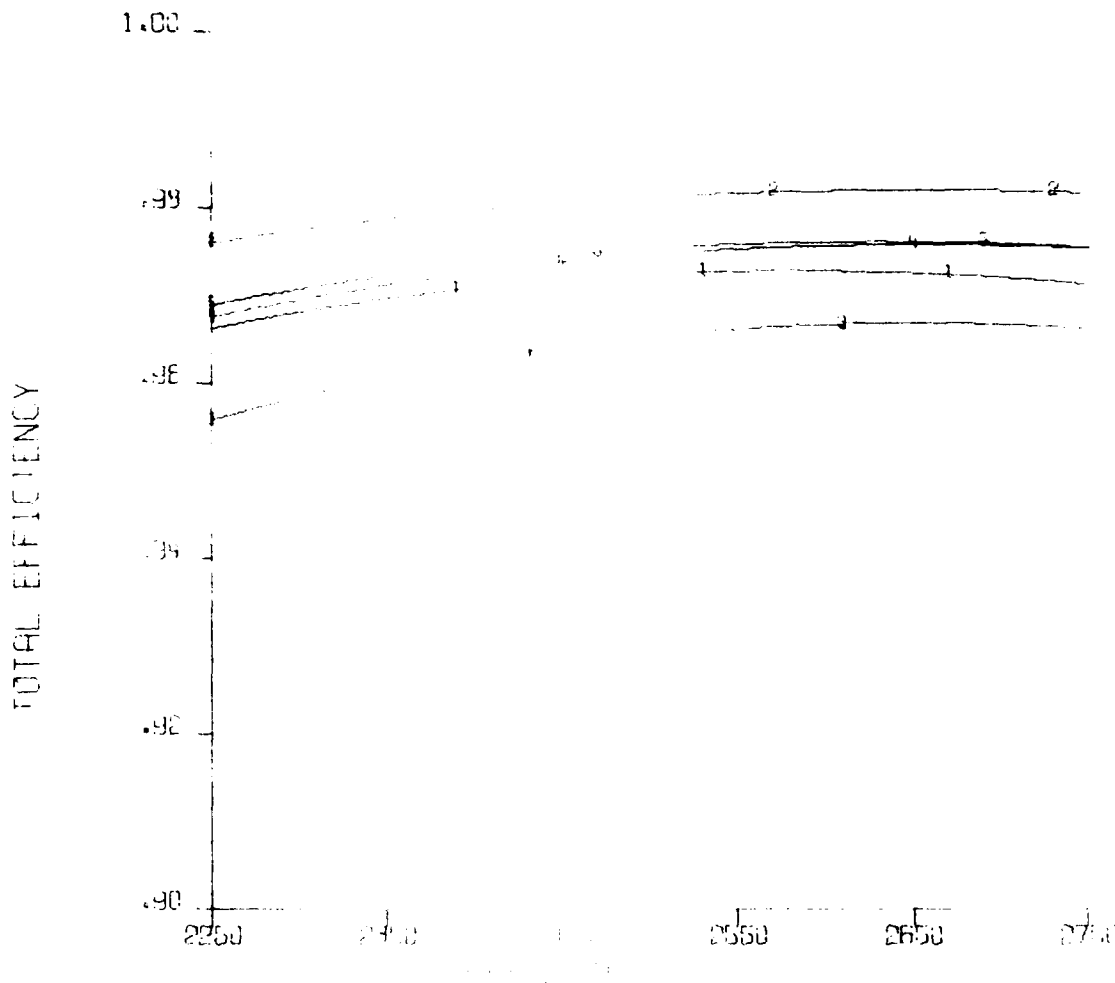
CURVE 1	MAX PRES	$3.70694046E04 + J7.66828215E04$
CURVE 2	MIN R	$3.48642781E03 + J7.81806304E03$
CURVE 3	MAX X	$3.43145191E04 + J7.70014372E04$
CURVE 4	MIN X	$3.30512498E03 + J6.91490765E03$
CURVE 5	AVG	$3.81596841E04 + J4.83015094E04$

[illegible]

TABLE 1: EFFICIENCY VERSUS FREQUENCY

CURVE	1	MAX	PRE	1	1.6134423000000000	1.6134423063700000
CURVE	1	MIN	PRE	1	1.6134423000000000	1.6134423063700000
CURVE	8	MAX	Y	1	1.7176094435000000	1.7176094436000000
CURVE	8	MIN	Y	1	1.7176094435000000	1.7176094436000000
CURVE	8	PRE		1	1.7176094435000000	1.7176094436000000

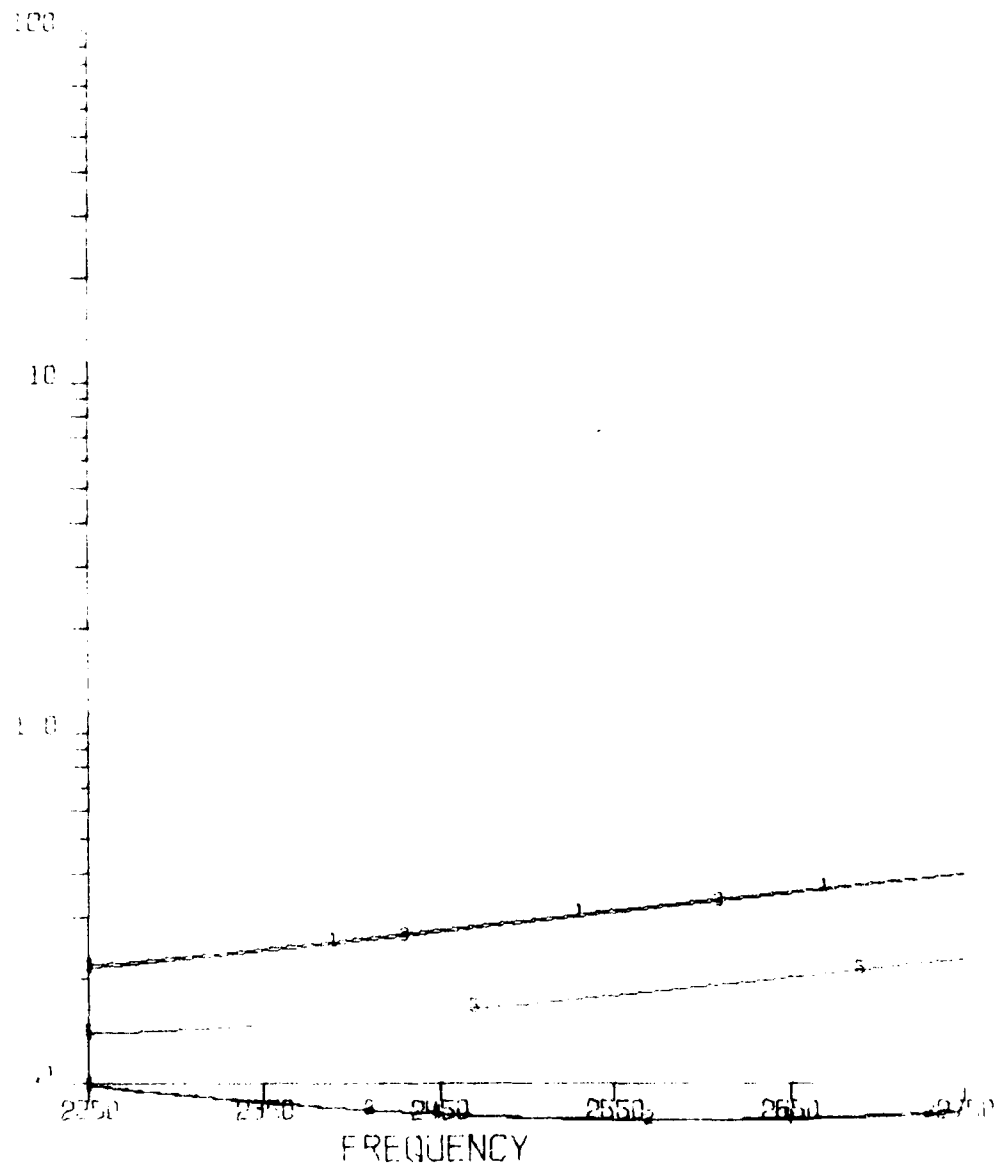
C.P. 1
 MID BEND
 LP 177 071E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PEK $4.44E-03 + J7.43469919E03$
 CURVE 2 - MAX R $4.44E-03 + J1.90794574E03$
 CURVE 3 - MIN R $4.44E-03 + J2.38239074E03$
 CURVE 4 - MIN X $4.44E-03 + J1.82753326E03$
 CURVE 5 - MIN $4.44E-03 + J3.81425445E03$

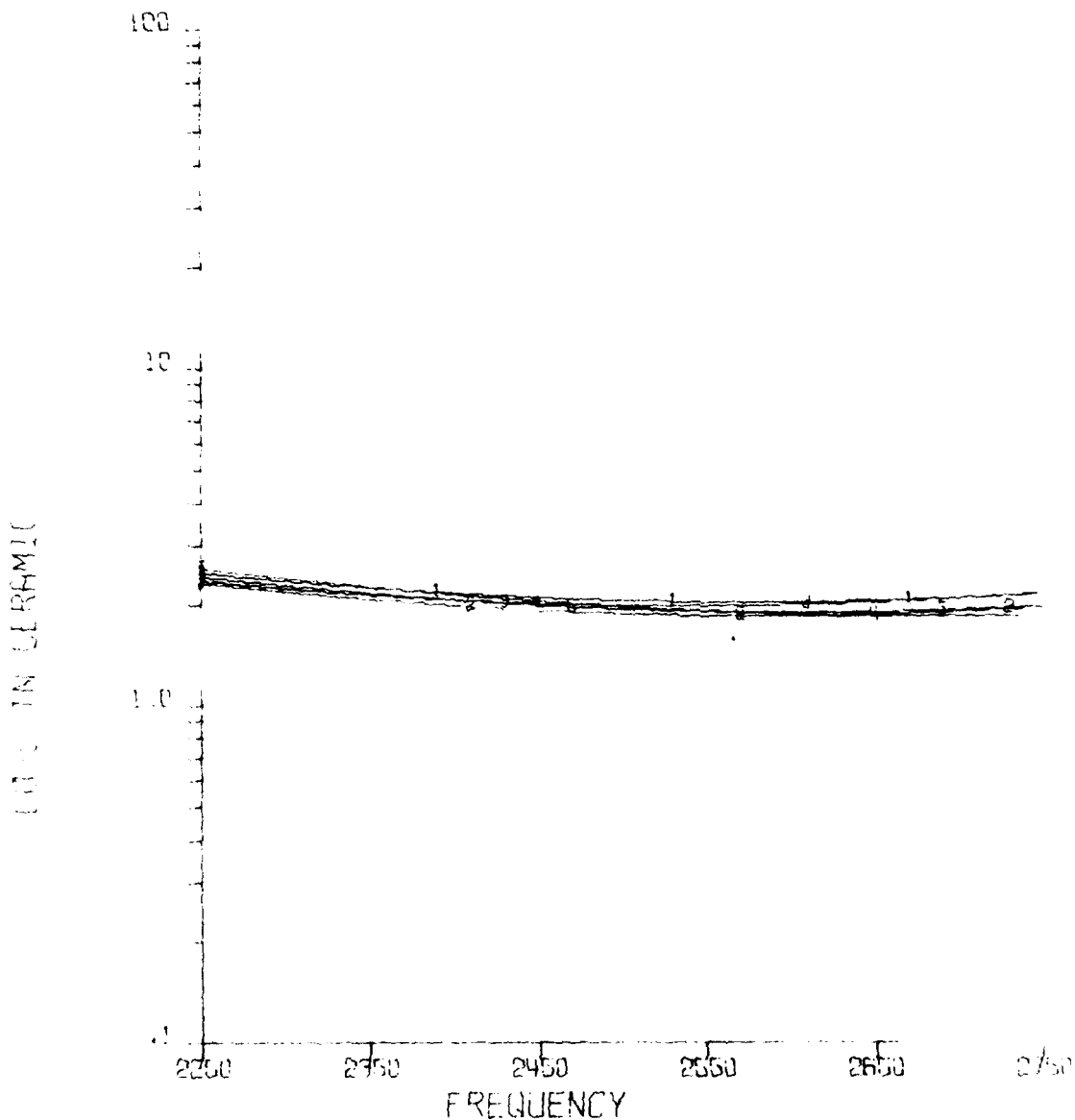
BE DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.3777 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70634046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.30512498E03+J6.91990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

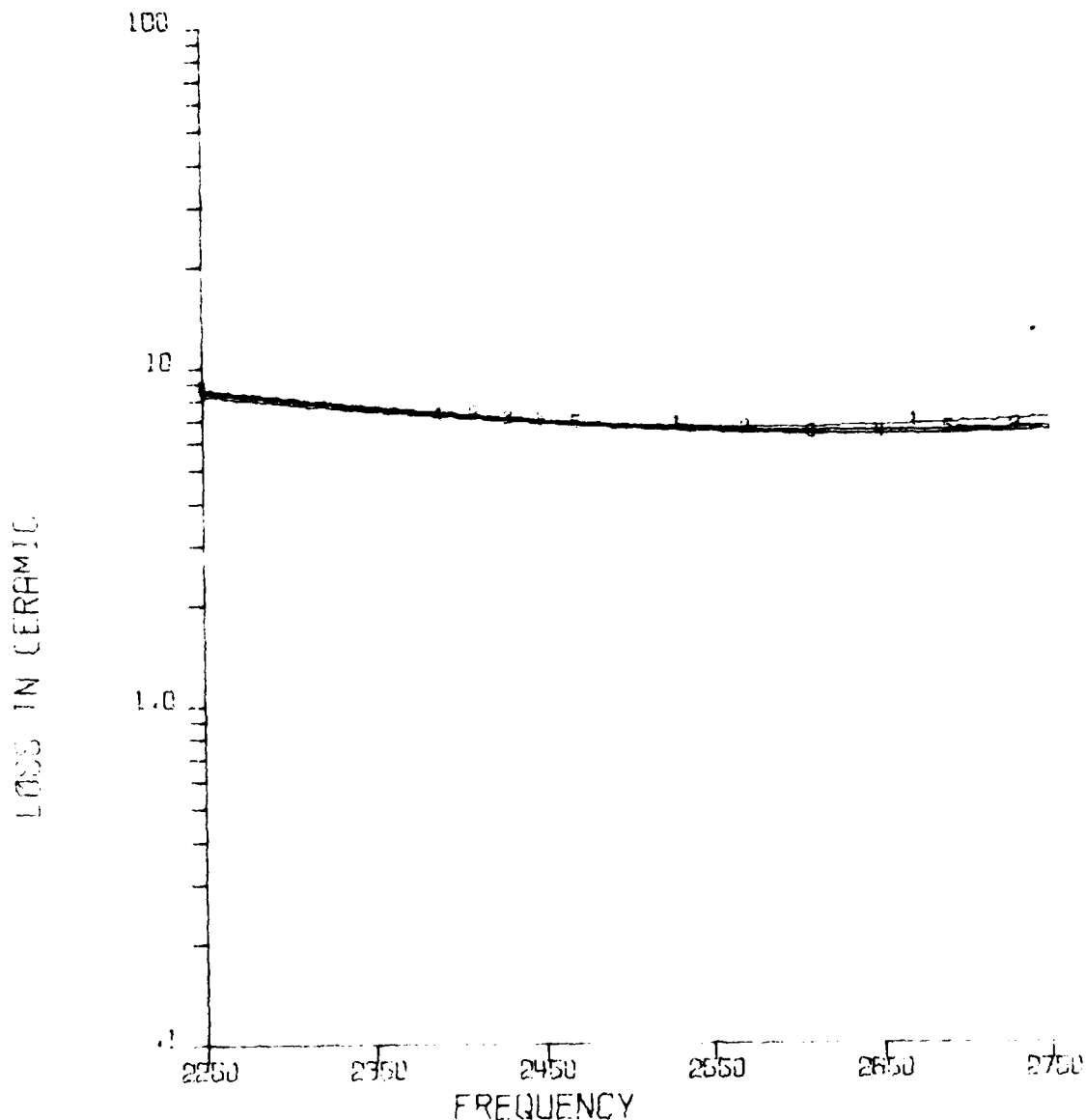
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3777 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E03
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

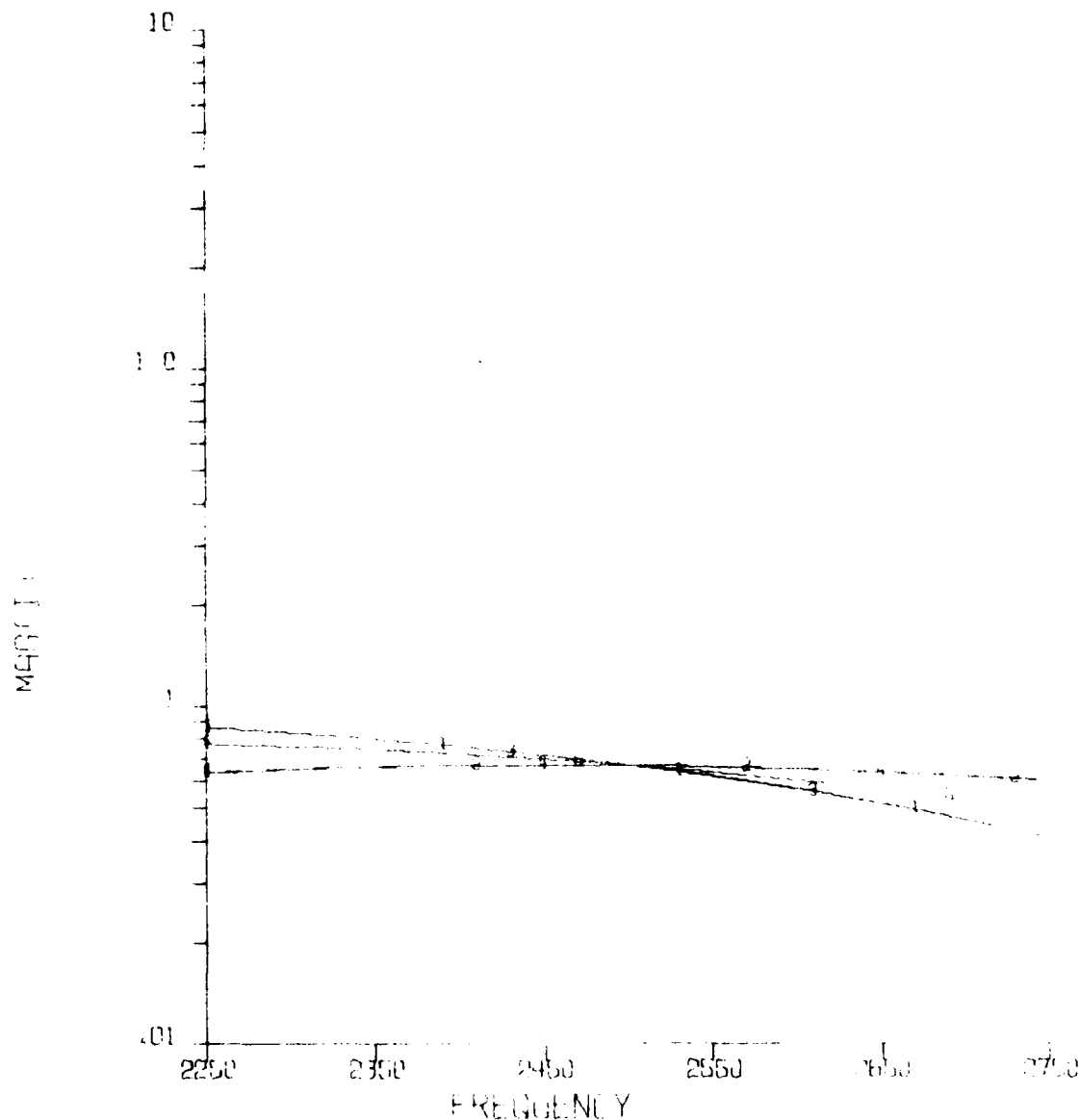
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3777 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R =8.18015867E03+J1.90784574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411695E03+J1.82753326E03
 CURVE 5 - AVG =6.13526911E03+J3.81425445E03

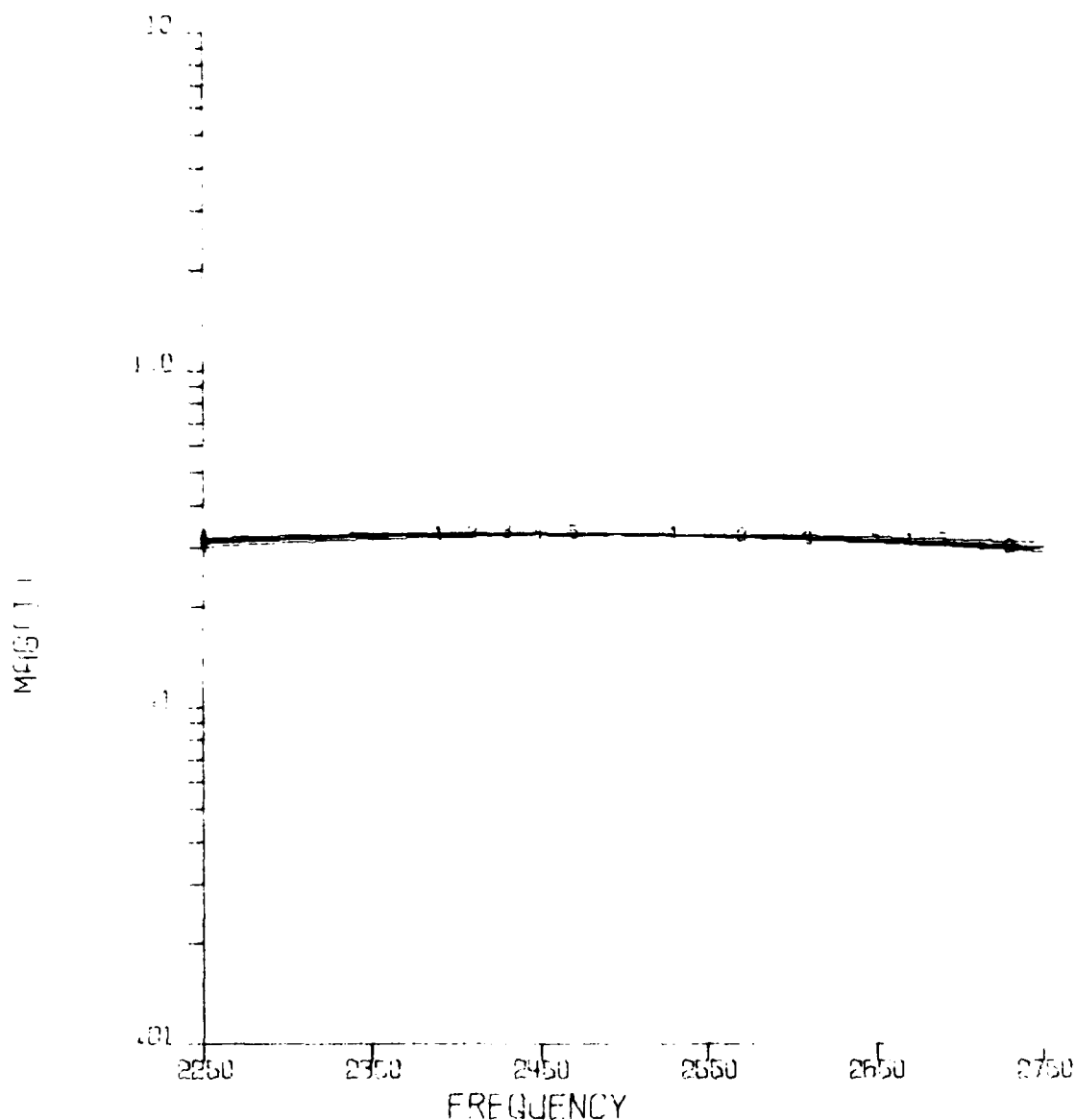
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.3777 QP=E+50



MAG |I| VERSUS FREQUENCY

CURVE 1 - MAX PRES	$3.70694046E04 + J7.66528E04$
CURVE 2 - MIN R	$3.48942791E03 + J7.81806794E03$
CURVE 3 - MAX X	$3.34314519E04 + J7.7001437E04$
CURVE 4 - MIN X	$3.380512498E03 + J6.91990765E03$
CURVE 5 - AVG	$3.31546941E04 + J4.83015094E04$

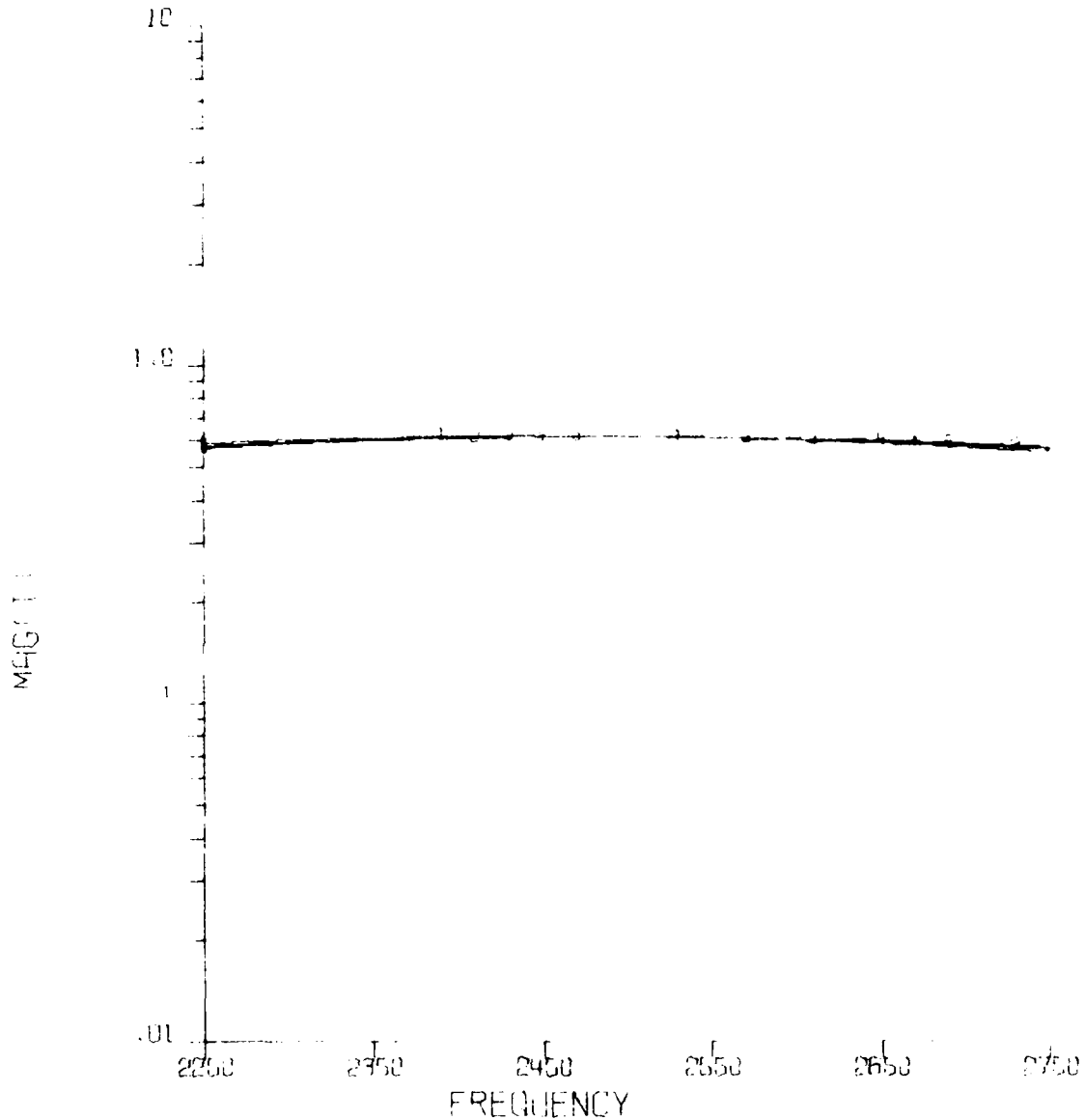
GE DUMILOAD 1
 C.F. 1 5000 CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.3777 GP=E+50



MAG(1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847304E04+J6.64039697E03
 CURVE 2 - MIN R -3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X -1.07609439E04+J1.06836049E04
 CURVE 4 - MIN X -1.28174594E04-J9.95386351E02
 CURVE 5 - AVG -1.09357651E04+J4.93621119E03

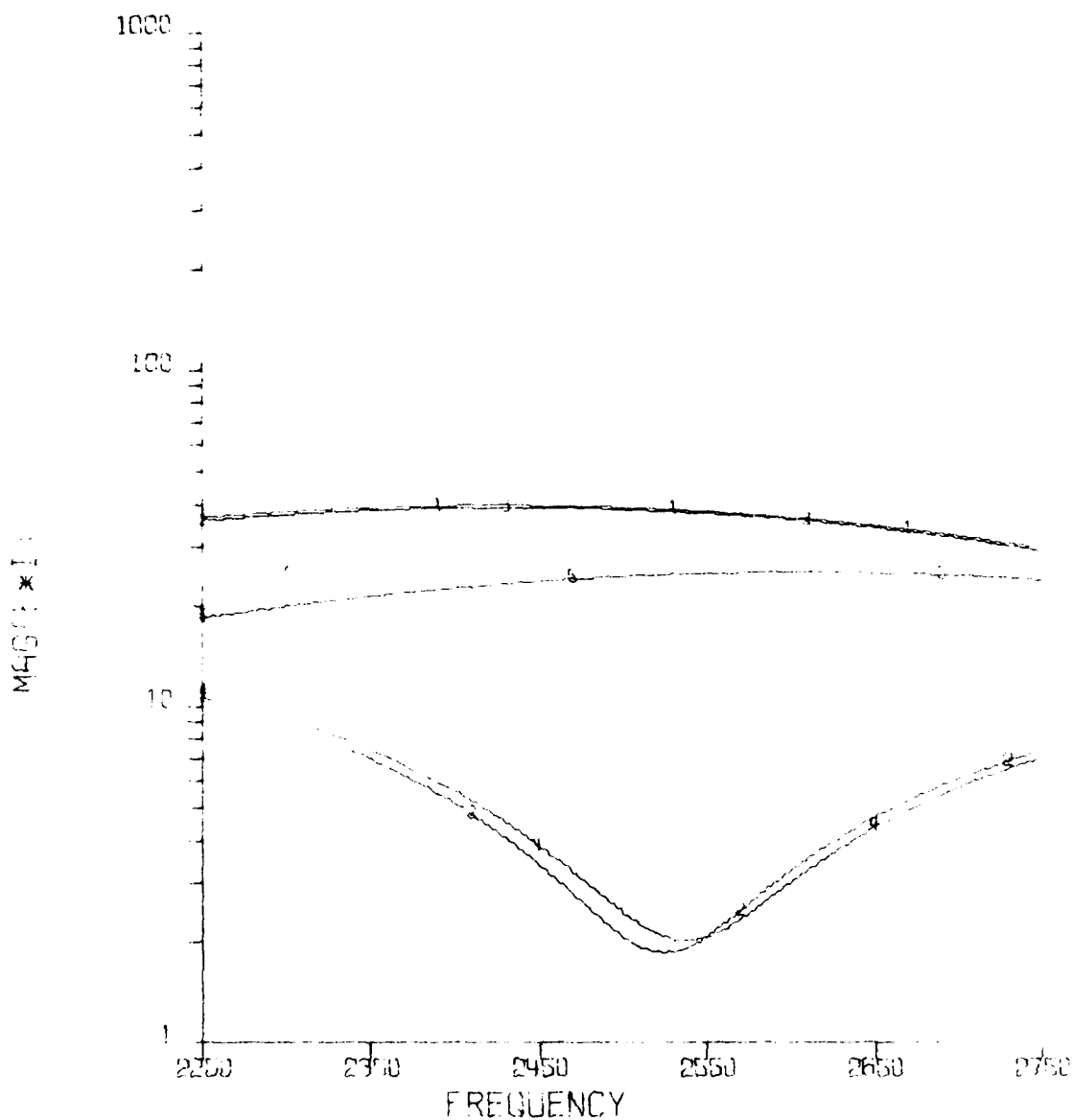
GE DUMILORD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADCAST 10.901
 LP=.3777 QP=E+50



MAG (1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R =8.18015967E03+J1.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411695E03+J1.82753326E03
 CURVE 5 - AVG =6.13526911E03+J3.81425445E03

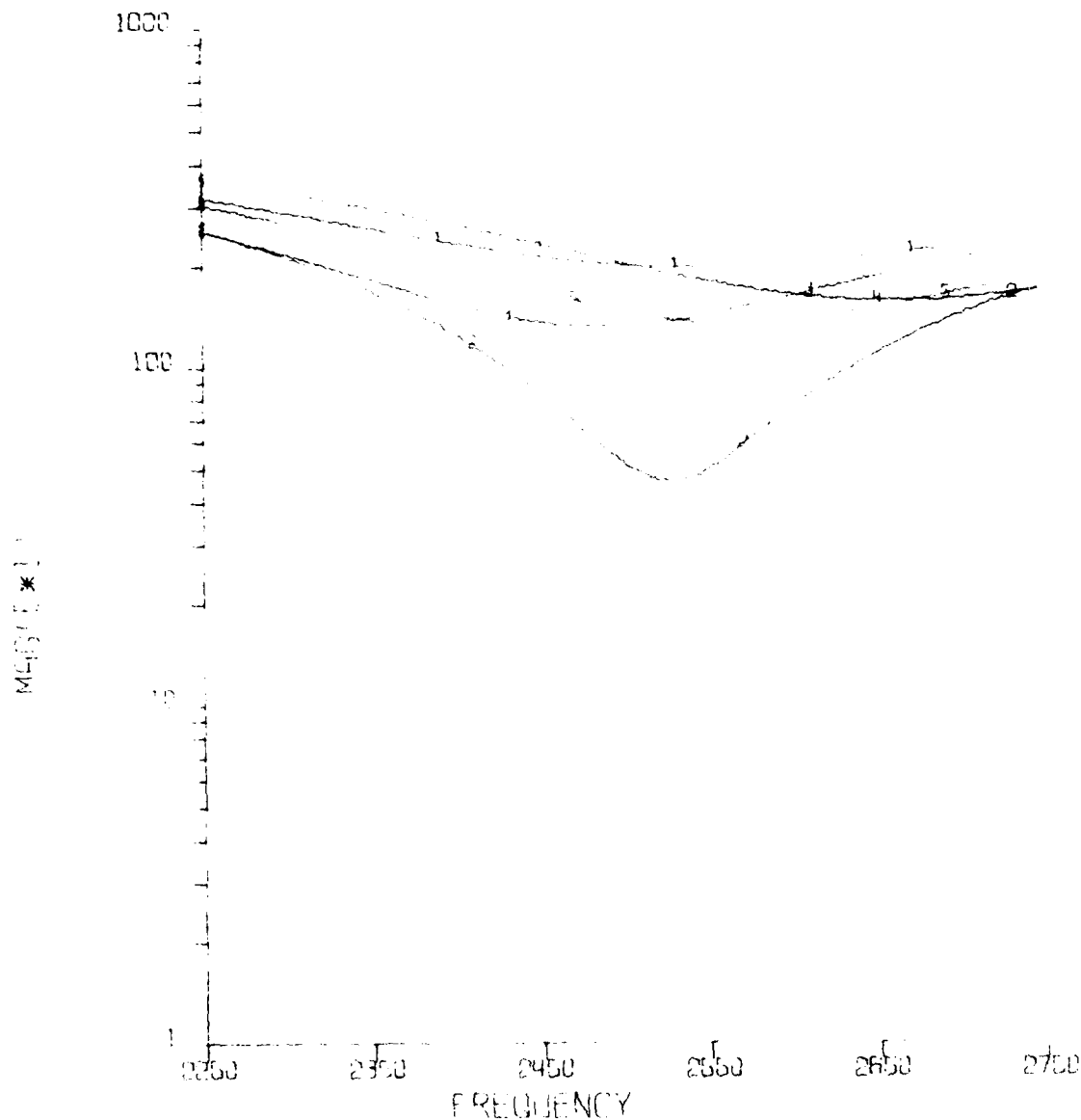
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.3777 QP=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48642781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.31990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

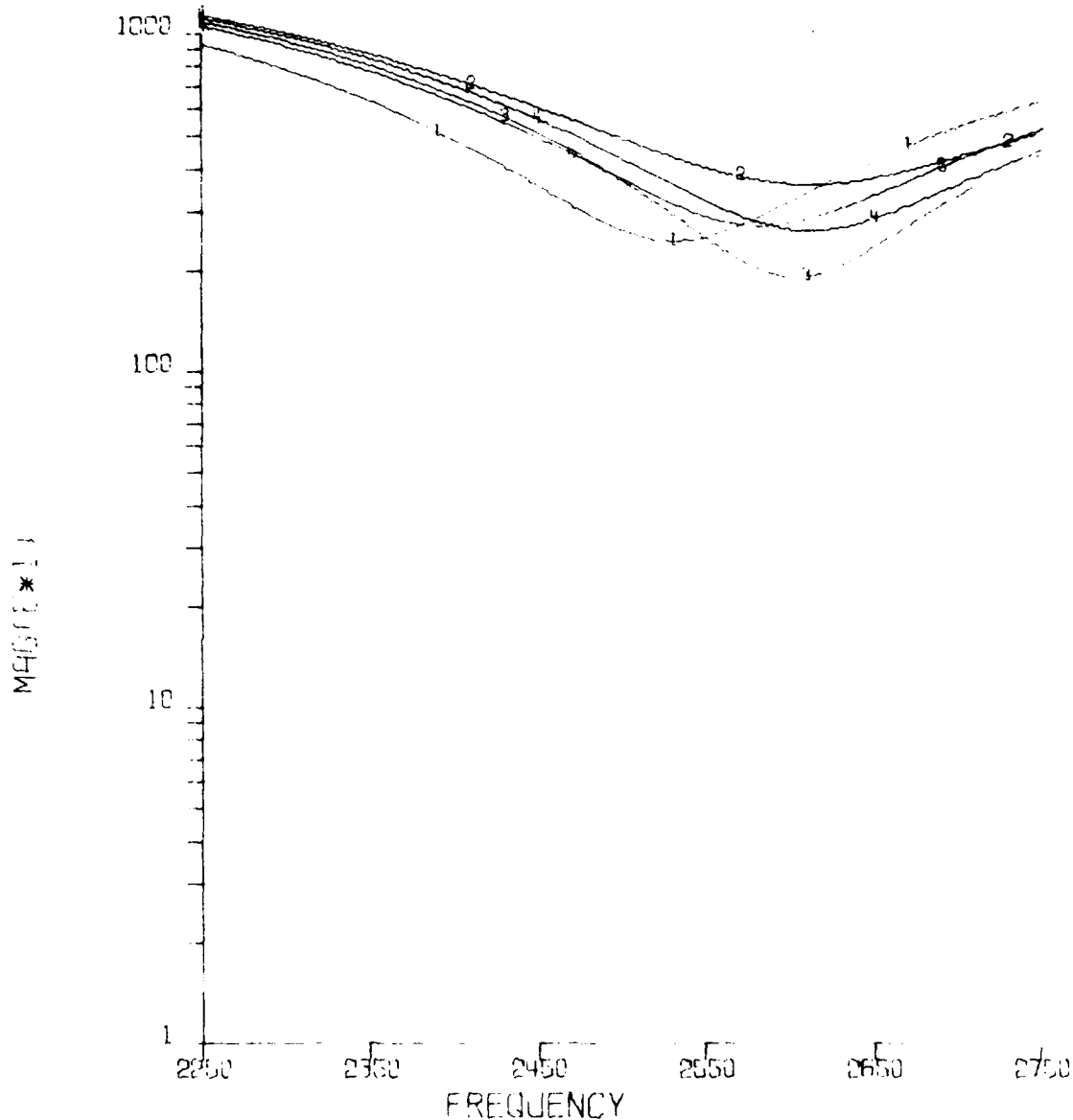
GE DUMIL MAC 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LPE=3777 OPE=+53



MAG (E * 10) VERSUS FREQUENCY

CURVE 1 - MAX PRES $1.61847804E04 + J6.64039697E03$
 CURVE 2 - MIN R $-3.66139341E03 + J7.66241496E03$
 CURVE 3 - MAX X $1.07609438E04 + J1.06858049E04$
 CURVE 4 - MIN X $-1.28174594E04 - J9.95386351E02$
 CURVE 5 - AVG $-1.03357651E04 + J4.93821119E03$

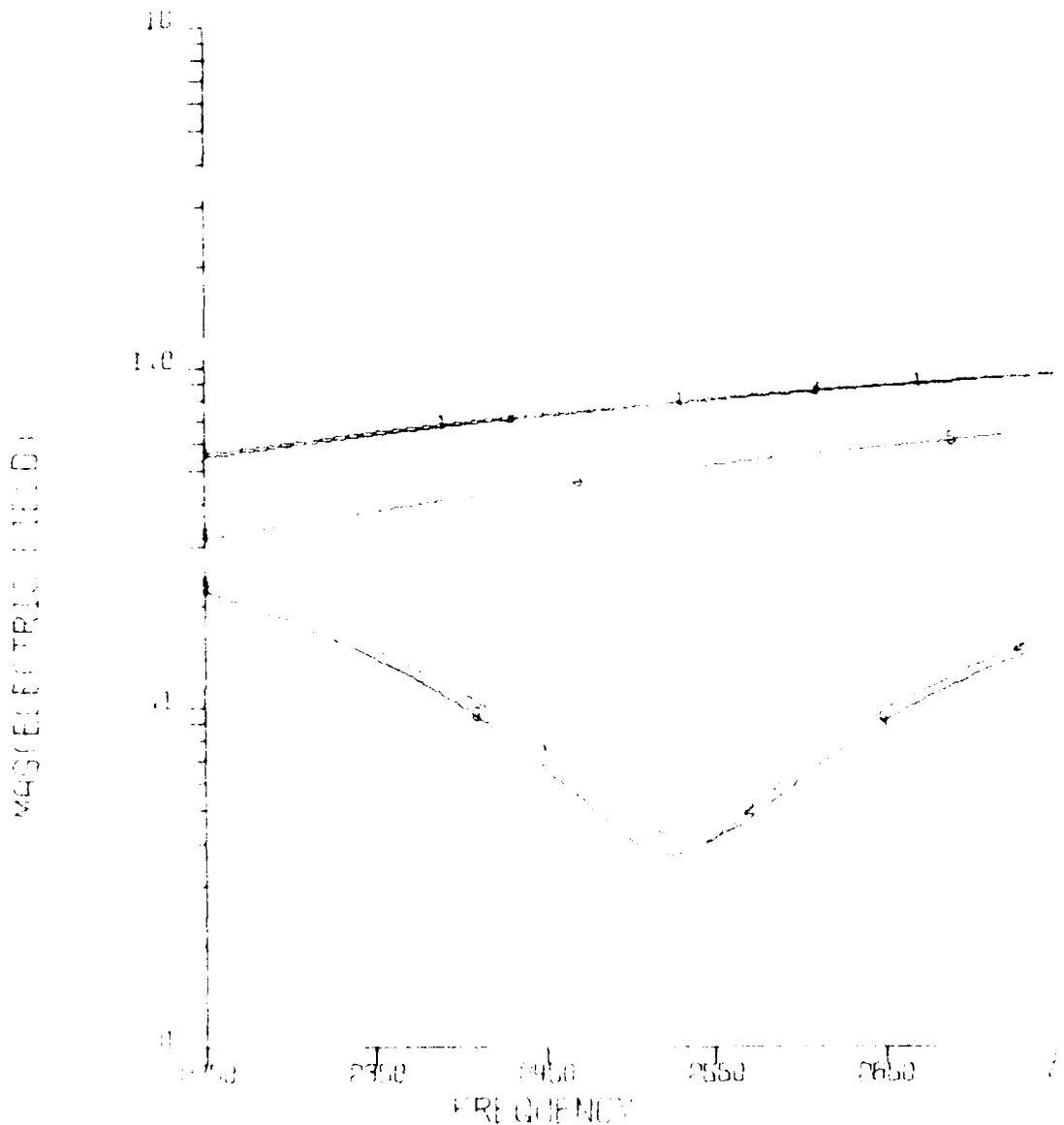
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3777 GP=L+50



MAG(E*1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R =8.18015867E03+J1.80754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.84411695E03+J1.82753326E03
 CURVE 5 - AVG =6.13526311E03+J3.81425445E03

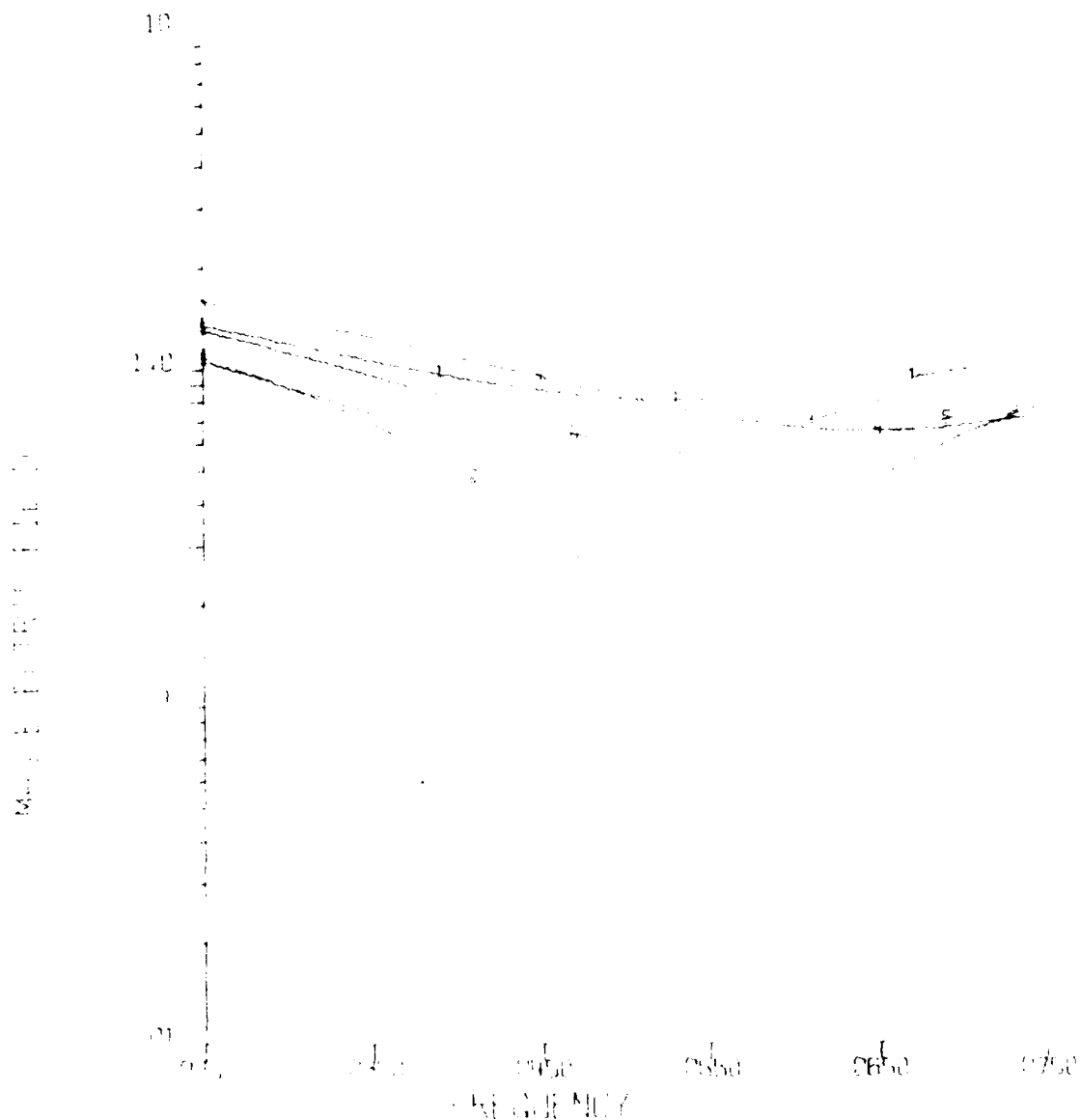
GE DUMLOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.3777 QP=E+50



MAGNETIC FIELD VERSUS FREQUENCY

LP# 1	MAX PRES	3.70894046E 04+J7.66878515E 04
LP# 2	MIN R	3.348542781E 03+J7.81806304E 03
LP# 3	MAX X	3.563145131E 04+J7.70014372E 04
LP# 4	MIN X	3.80517509E 03+J6.51199076E 03
LP# 5	AVG	3.731596841E 04+J4.85015054E 04

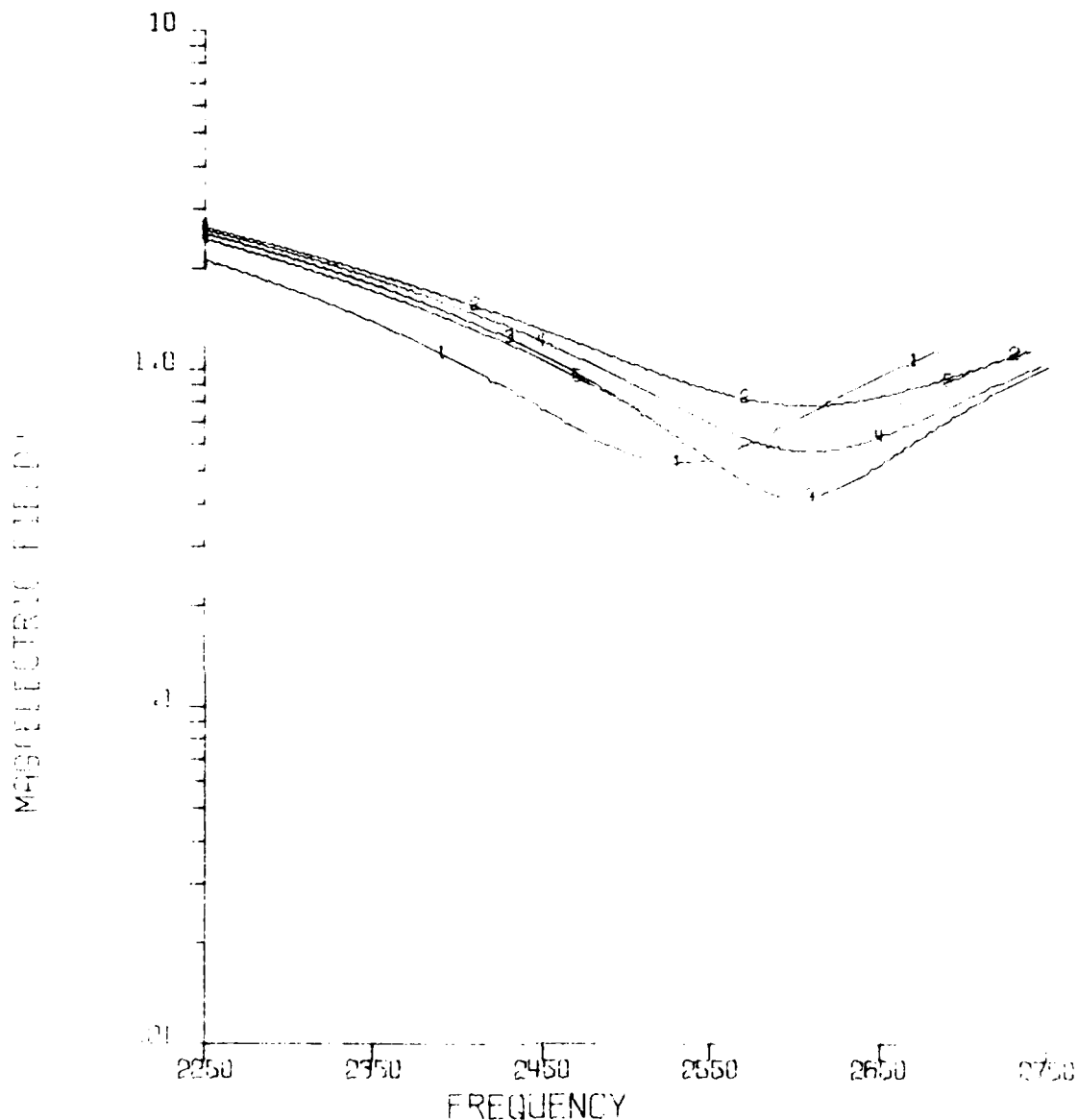
GE JUMIL DAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP-3777 GP-E+50



MAGNETIC FIELD VS. FREQUENCY

CURVE 1	MAX	PR 1	1.61547804E+04+06.64038697E+03
CURVE 2	MIN	R	1.31613451E+03+07.66241486E+03
CURVE 3	MAX	X	1.117603438E+04+01.06836049E+04
CURVE 4	MIN	X	1.03170599E+04+09.95386351E+02
CURVE 1	PR 1		1.04167091E+04+04.33621119E+03

GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.3777 QP=E+50



MAGNETIC FIELD VERSUS FREQUENCY

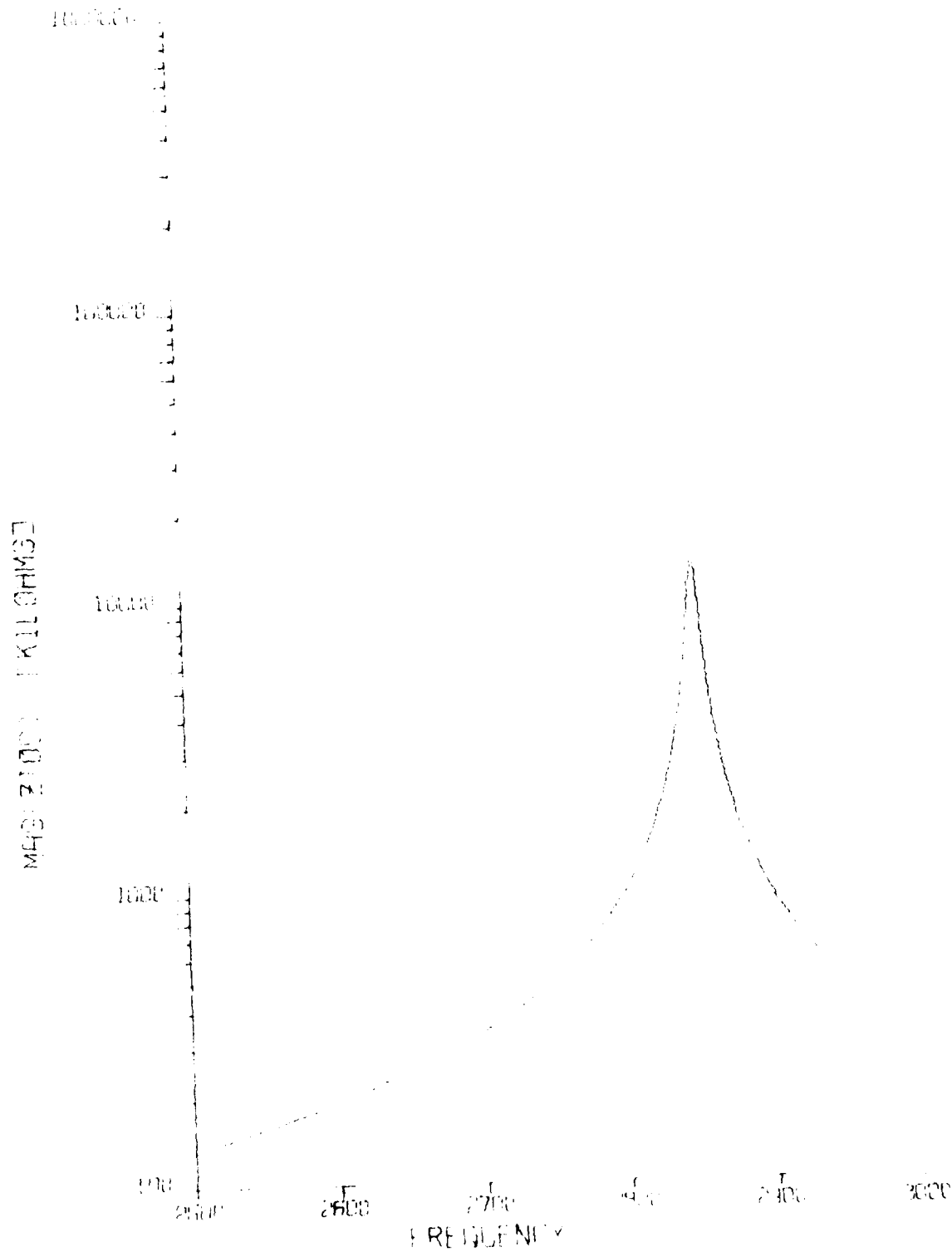
CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R -8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R -4.27851865E03+J2.39239074E03
 CURVE 4 - MIN X -5.83441169E03+J1.82753326E03
 CURVE 5 - AVG -6.13526911E03+J3.81425445E03

TRACOR, INC.

HIGH BAND

C.P. 1 5 INCH CIRCULAR HEAD
HIGH BAND

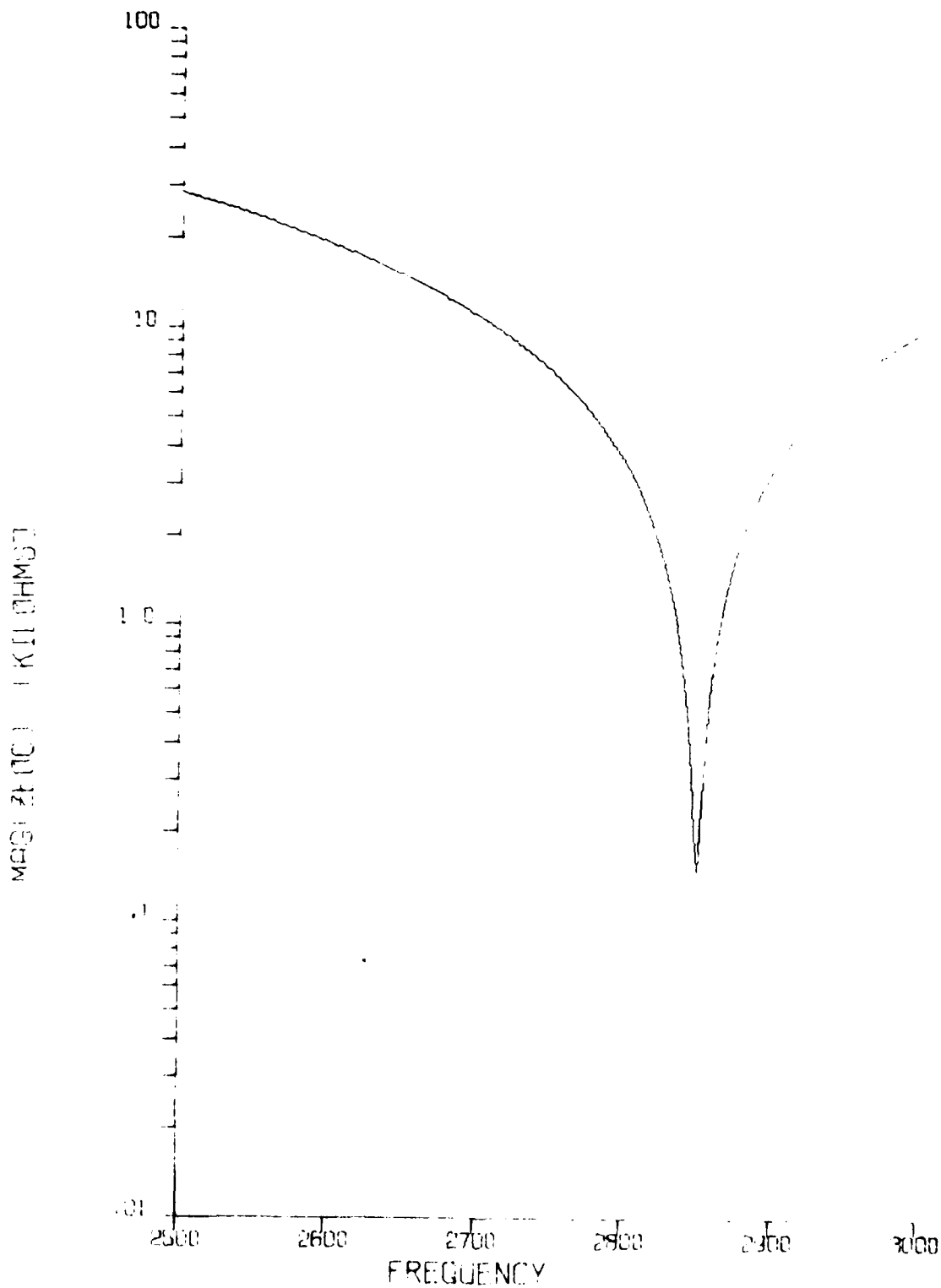
LP=.2762 GP=E+50 CS=.3373E-7 DS=0



MAGZ (1000) VERSUS FREQUENCY

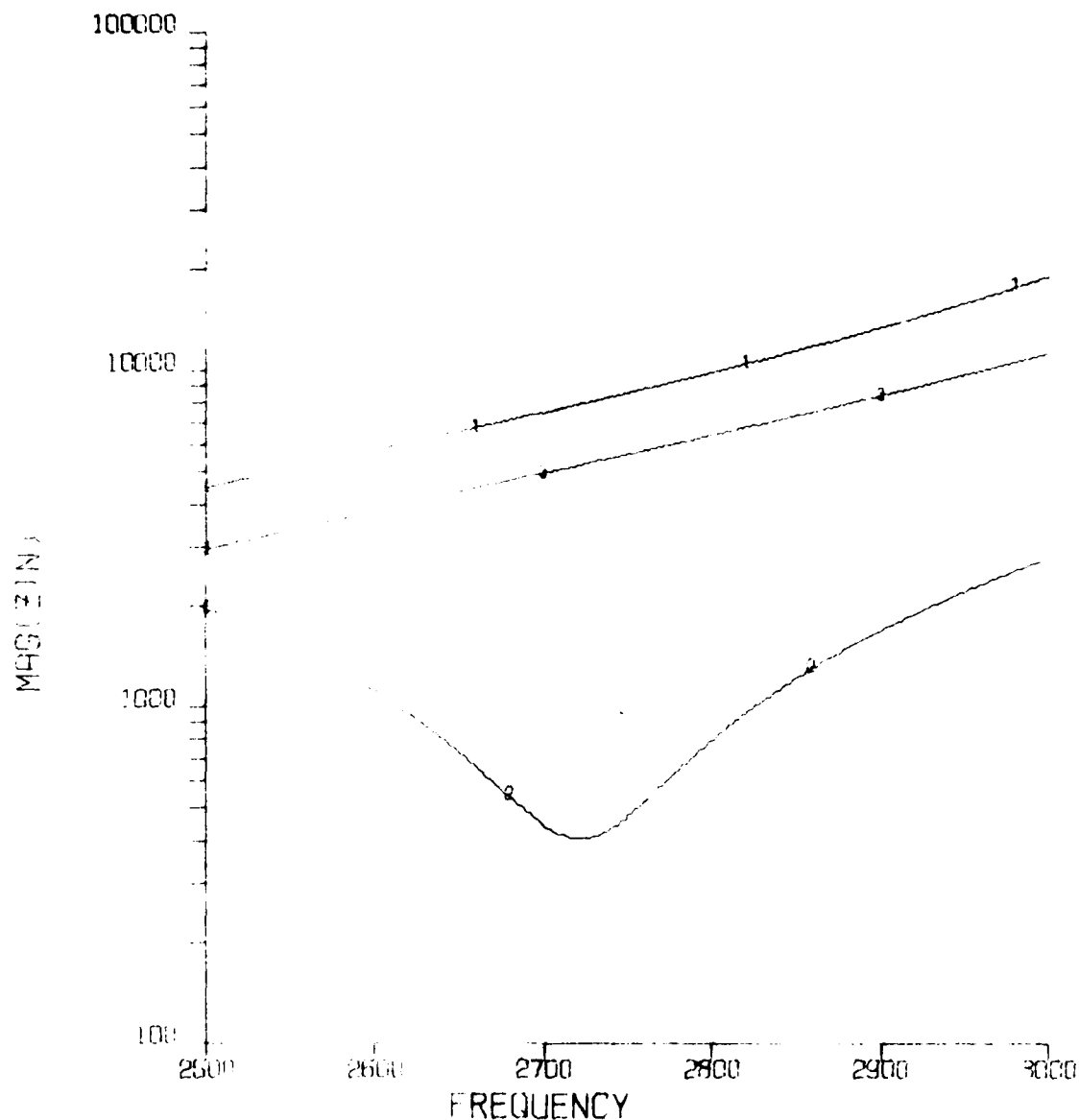
C.P. 1 5 INCH CIRCULAR HEAD
HIGH BAND

LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAGNETIC PERMEABILITY VERSUS FREQUENCY

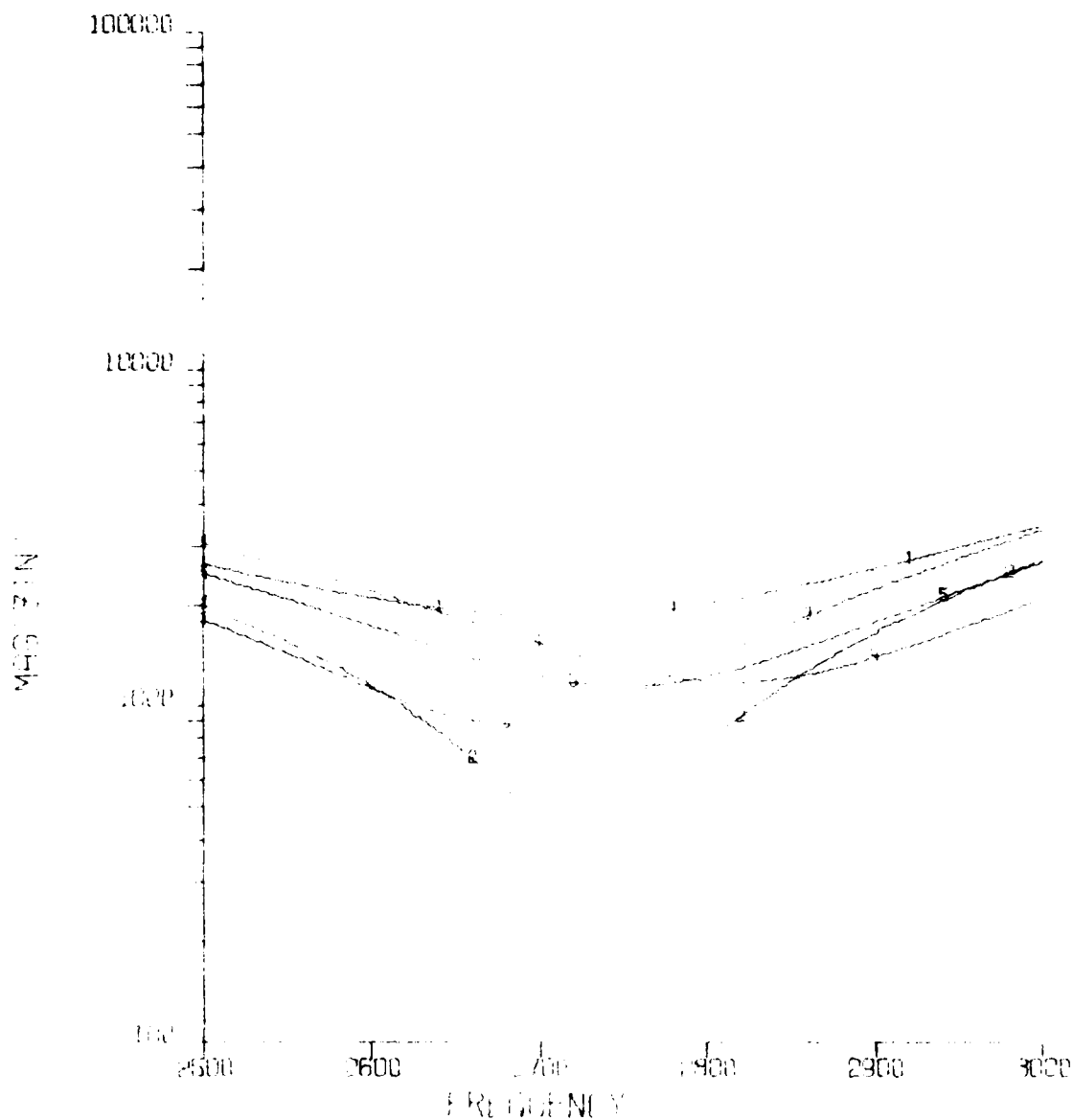
GE DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 AVG =3.05065992E04+J5.25781665E04

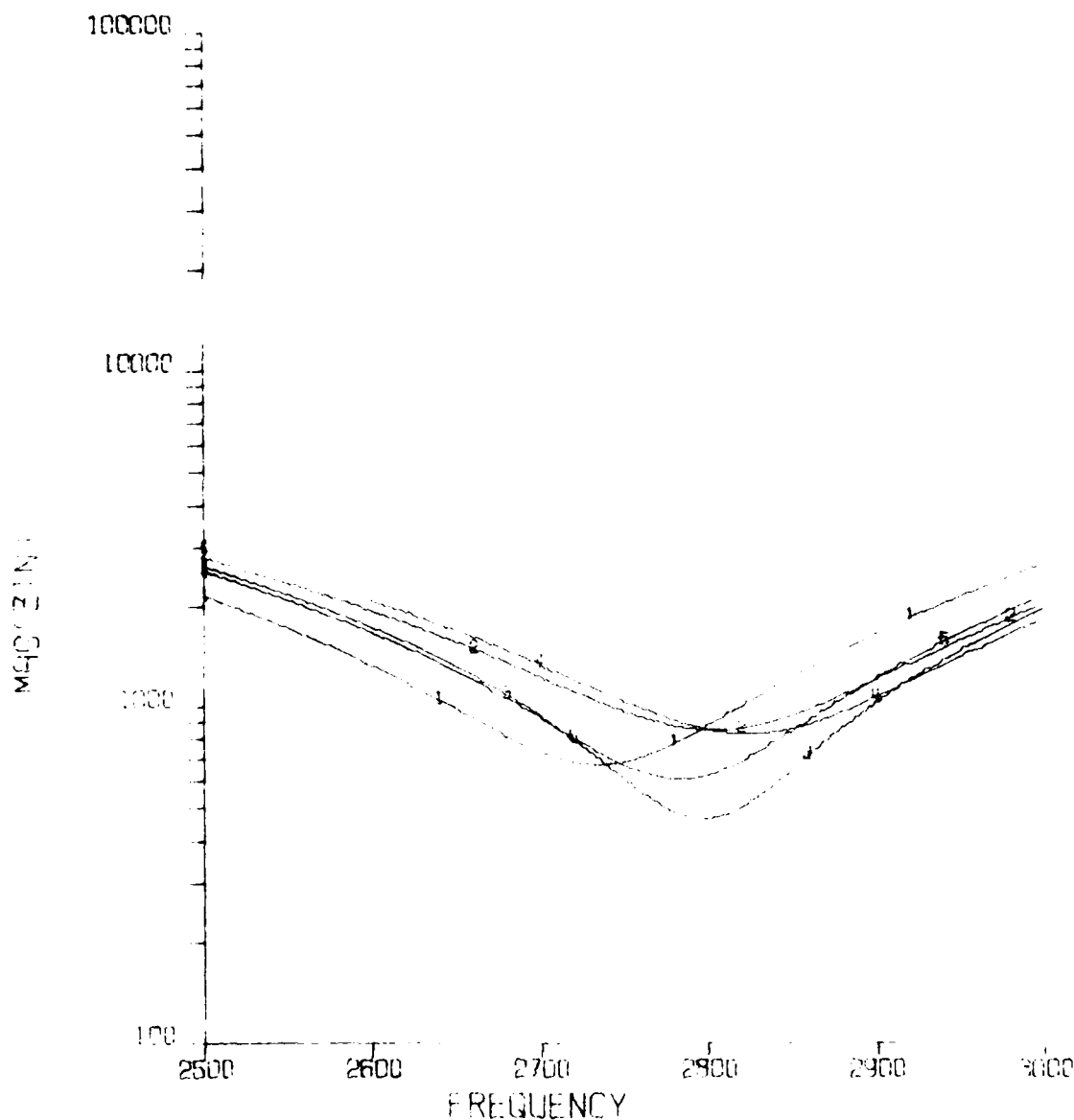
.05 DUMIL QAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(ZIN) VERSUS FREQUENCY

CURVE 1	MAX PRES	1.6530E+04+J8.10088048E03
CURVE 2	MIN R	3.5737E+03+J9.01288799E03
CURVE 3	MAX X	8.4477E+03+J1.20617606E04
CURVE 4	MIN X	8.7354E+03+J1.52307537E03
CURVE 5	AVG	1.9395E+03+J6.38905526E03

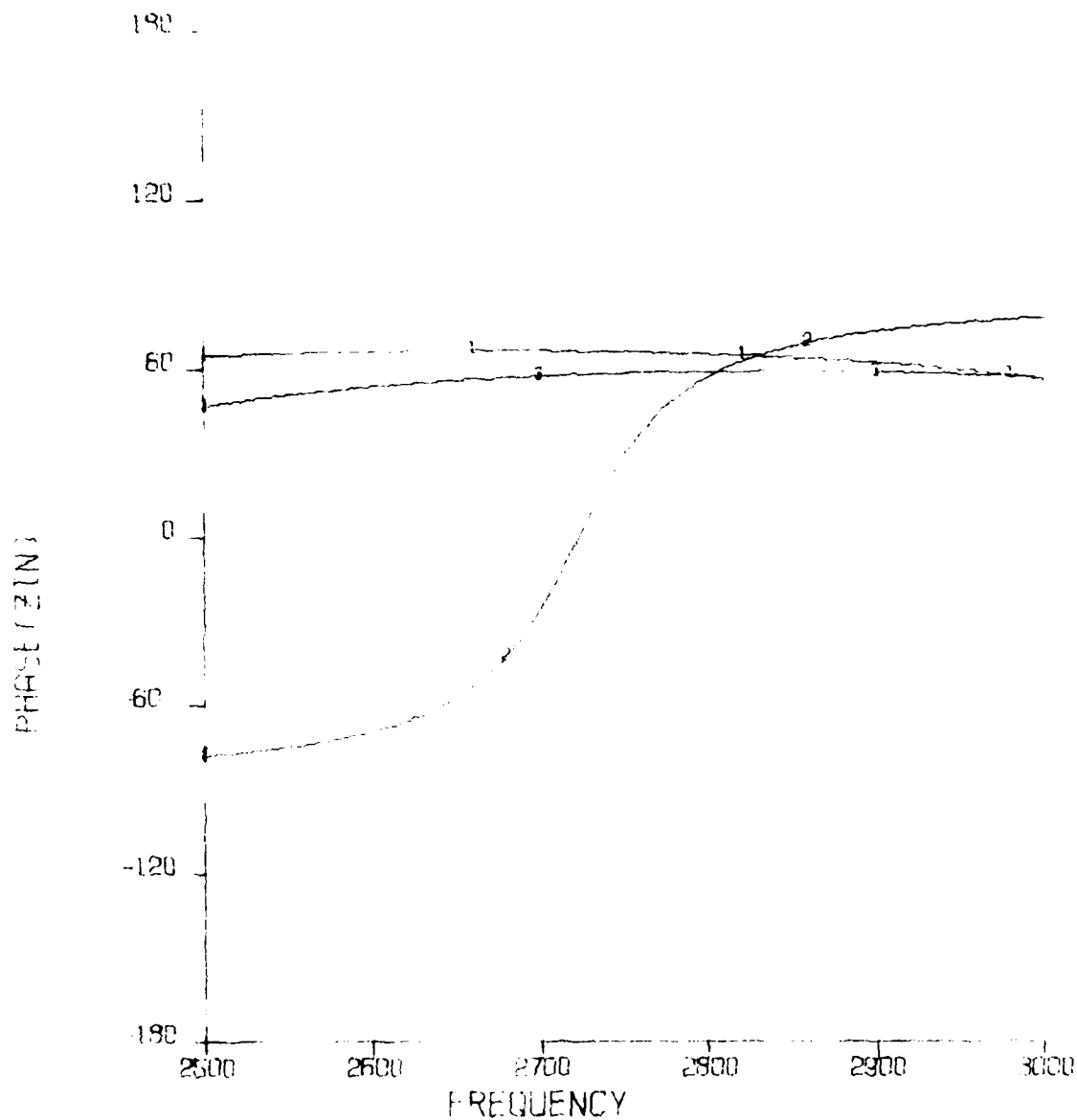
GE DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985736E03
 CURVE 3 - MIN R =3.78646591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

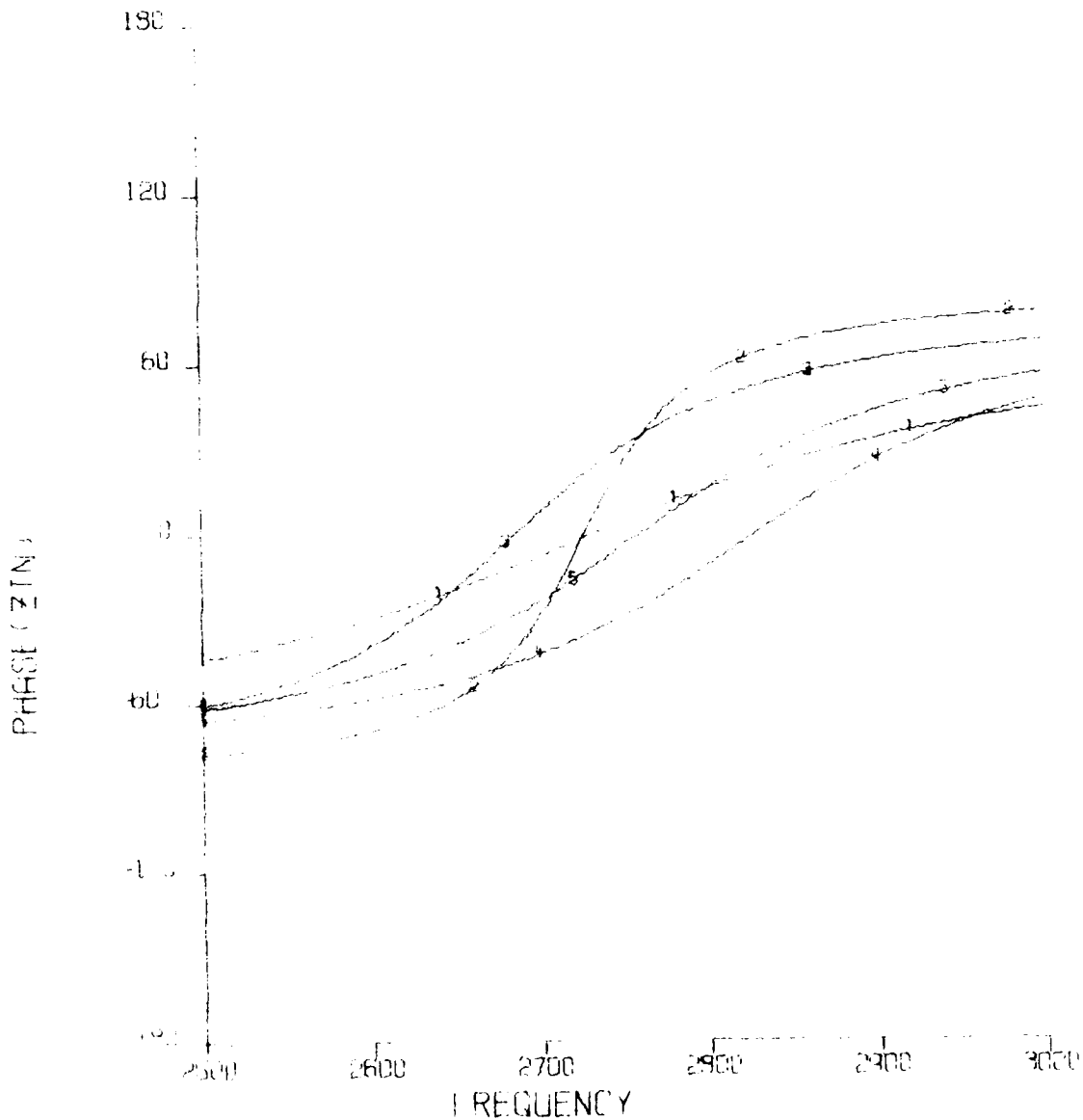
GE DUMILCAD I
 C/P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (O.C)
 1-2762 OP=E+50 CS=.3373E-7 DS=0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.25781665E04

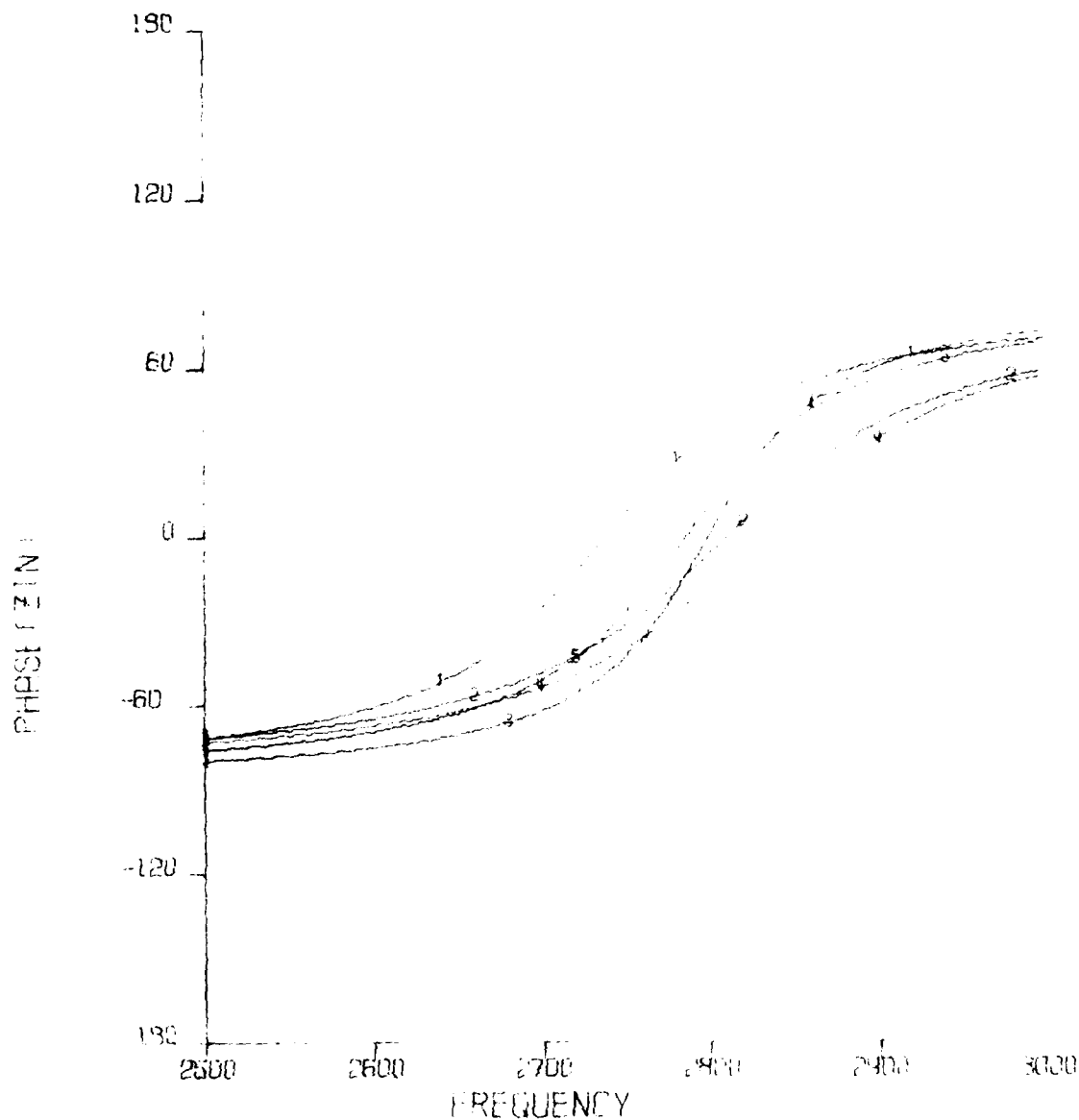
GE DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0,30)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 MIN R =3.63874880E03+J9.01288799E03
 CURVE 3 MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 MIN X =9.73845096E03+J1.52307533E03
 CURVE 5 AVG =9.99594457E03+J6.38905526E03

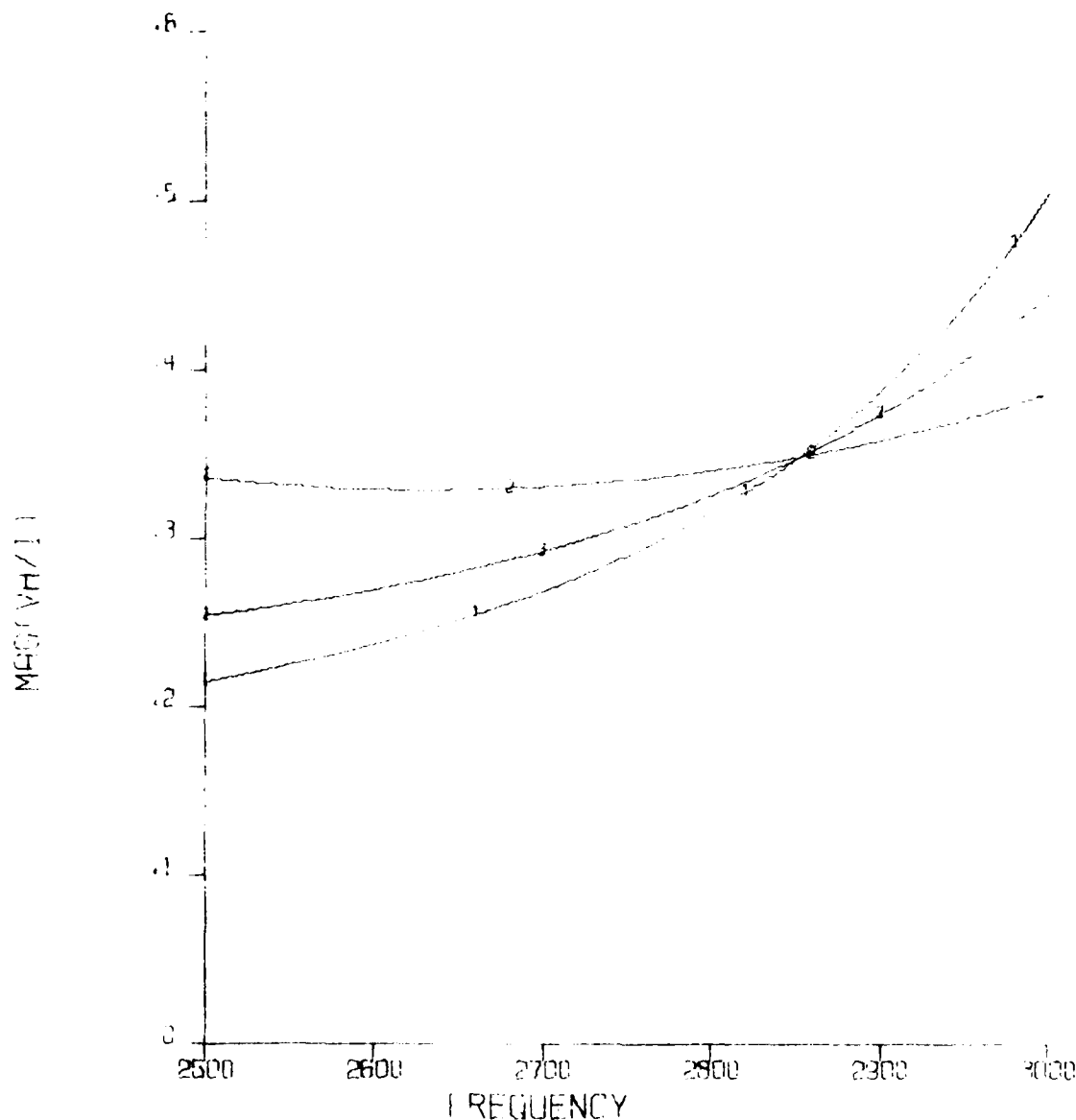
GE DUMILORD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 QP=E+50 CS=.3373E 7 DS=0



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.74985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634103E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

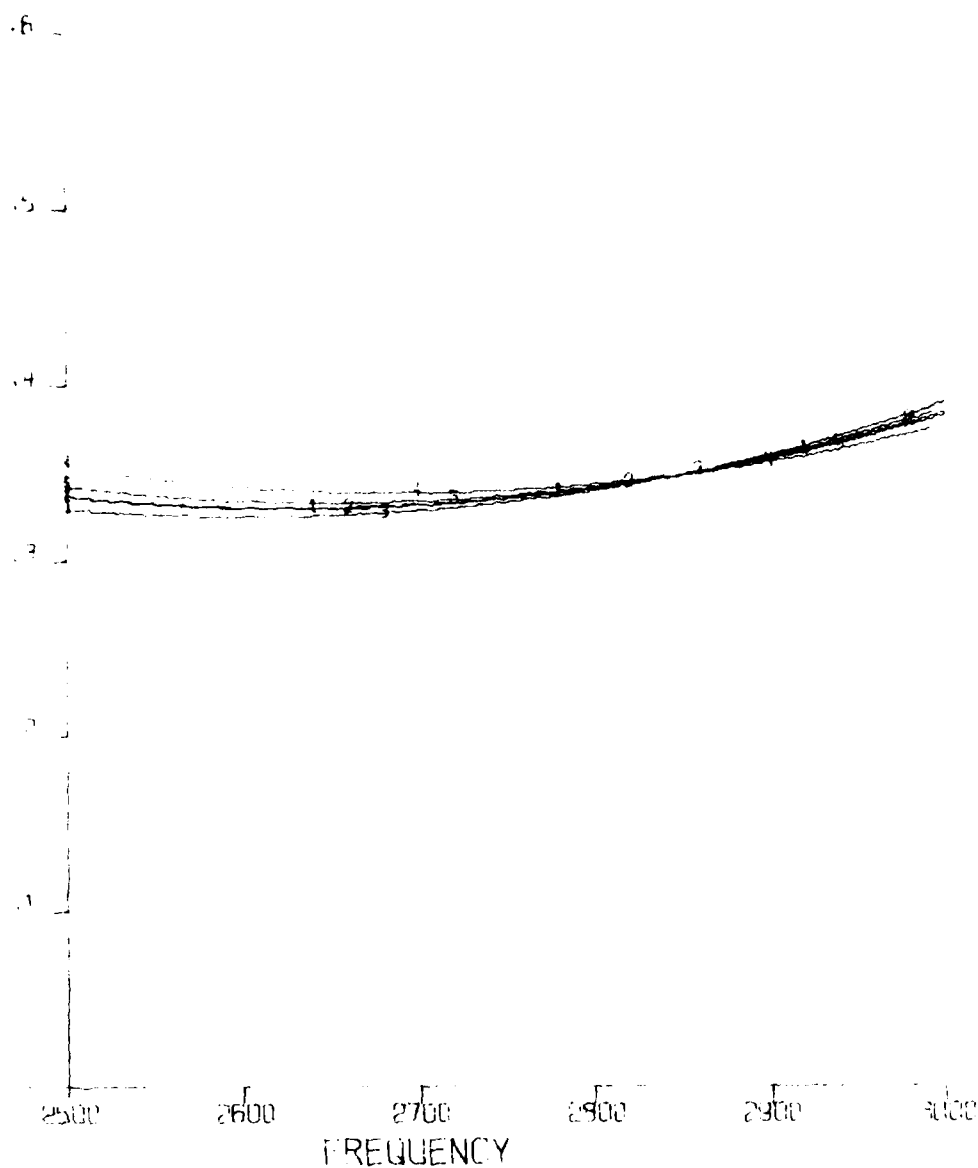
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES $4.03976761E04 + J8.48503975E04$
 CURVE 2 - MIN R $3.50168917E03 + J9.28735198E03$
 CURVE 3 - AVG $3.05065992E04 + J5.25781665E04$

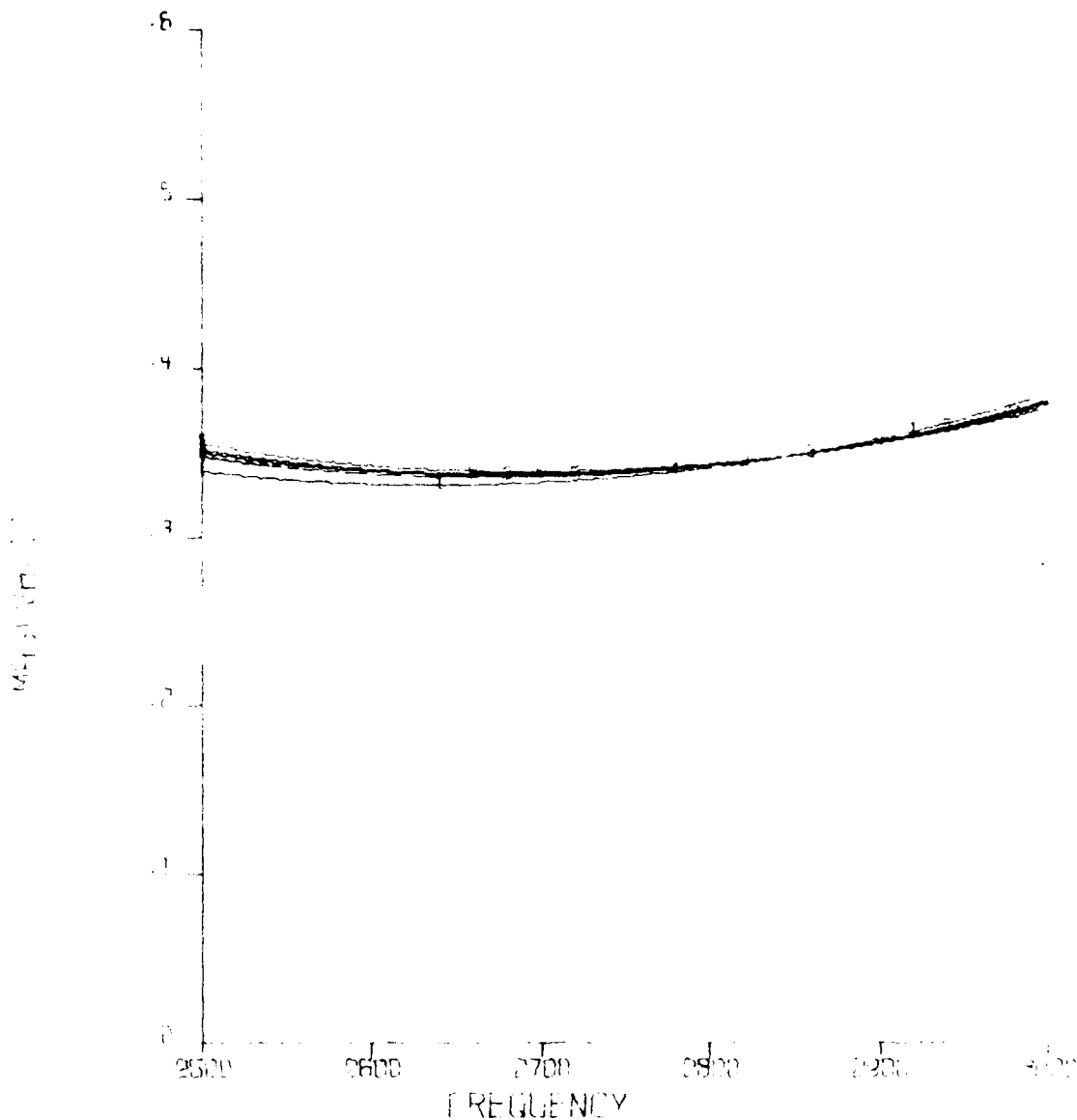
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0,30)
 LP=.2762 UP=E+50 CS=.3373E-7 DS=0



MAG(VH/I) VERSUS FREQUENCY

CURVE 1	MAX PRES=	1.65302281E04+J8.10088048E03
CURVE 2	MIN R	=3.53874880E03+J9.01288799E03
CURVE 3	MAX X	=8.44770071E03+J1.20617606E04
CURVE 4	MIN X	=9.73845096E03+J1.52307530E03
CURVE 5	MAX	=9.80394457E03+J6.38905526E03

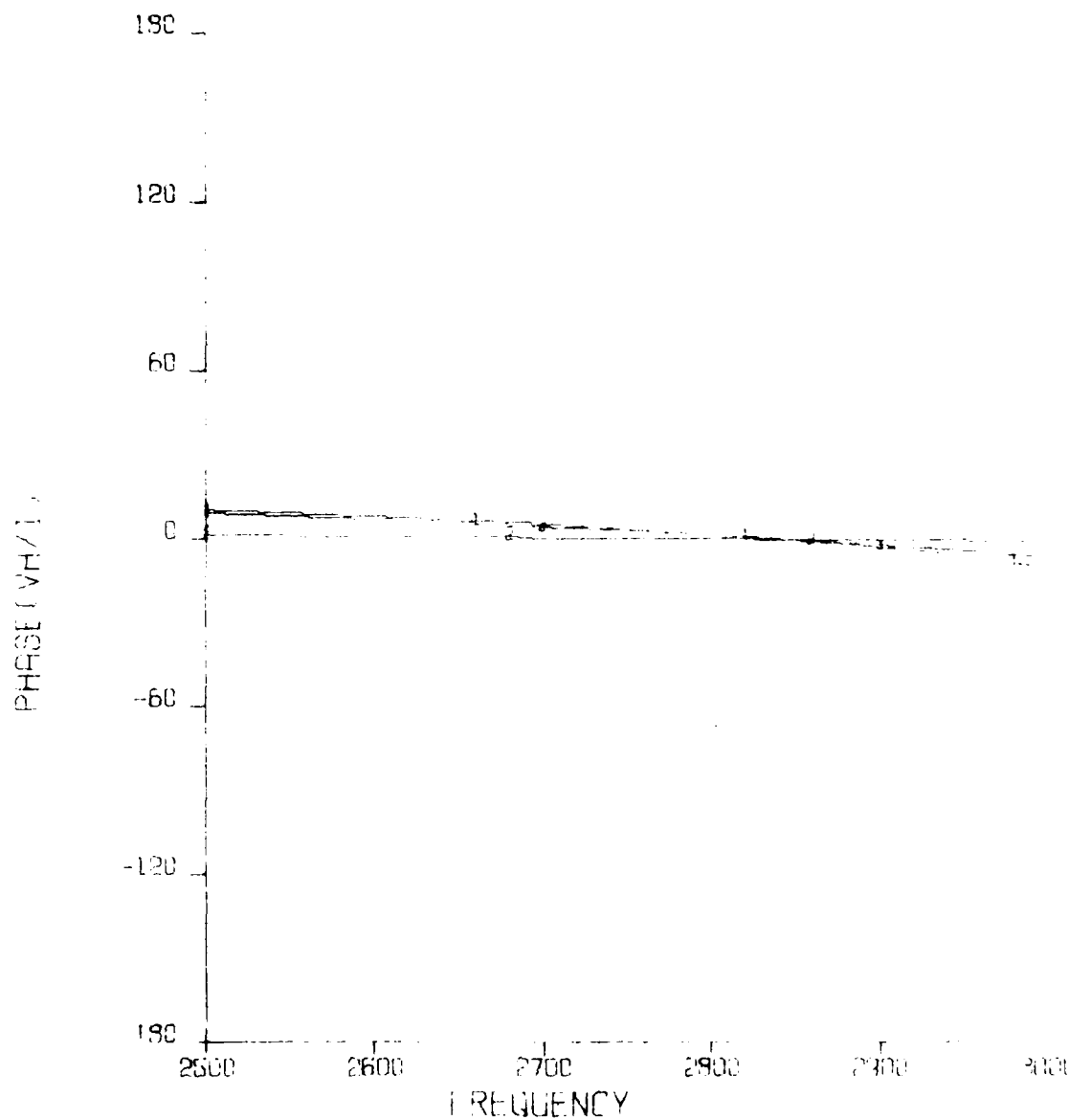
RE DUMILOAD I
 C.D. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG (V/H/1) VERSUS FREQUENCY

CURVE 1	MAX	PRE	5.83276748E03+J8.12301916E03
CURVE 2	MAX	R	1.70487244E03+J2.73985718E03
CURVE 3	MIN	R	1.37863059E03+J3.6452049E03
CURVE 4	MIN	X	1.61705103E03+J1.4108407E03
CURVE 5	AV		1.50165112E03+J4.58678978E03

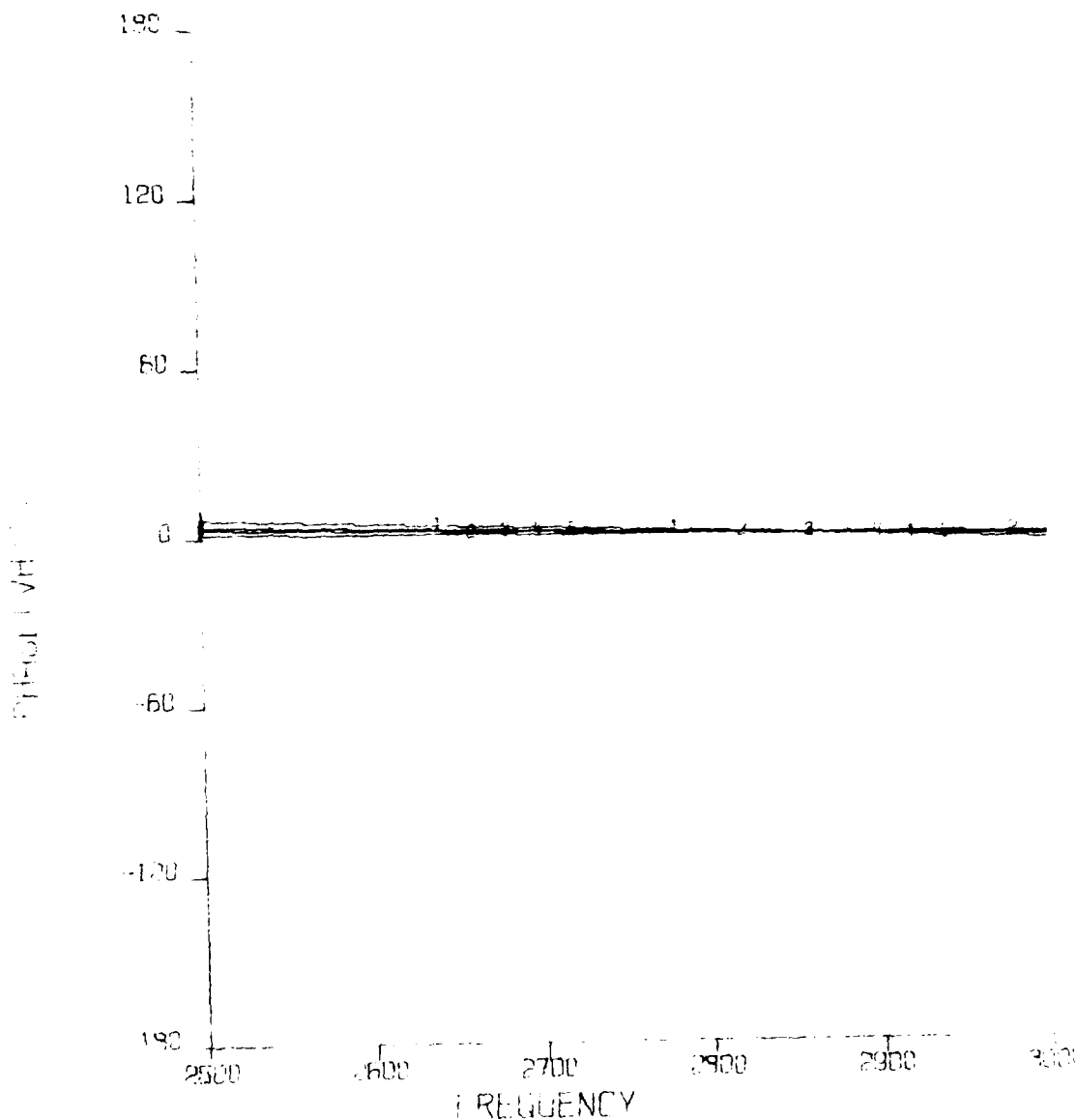
BE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (O.O)
 LP=.2762 CP=E+50 CS=.3373E-7 DS=0



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRE 54.63970761E04+J8.48303971E04
 CURVE 2 - MIN R -3.50168917E03+J9.28735198E03
 CURVE 3 - AVG -3.05065908E04+J5.20731665E04

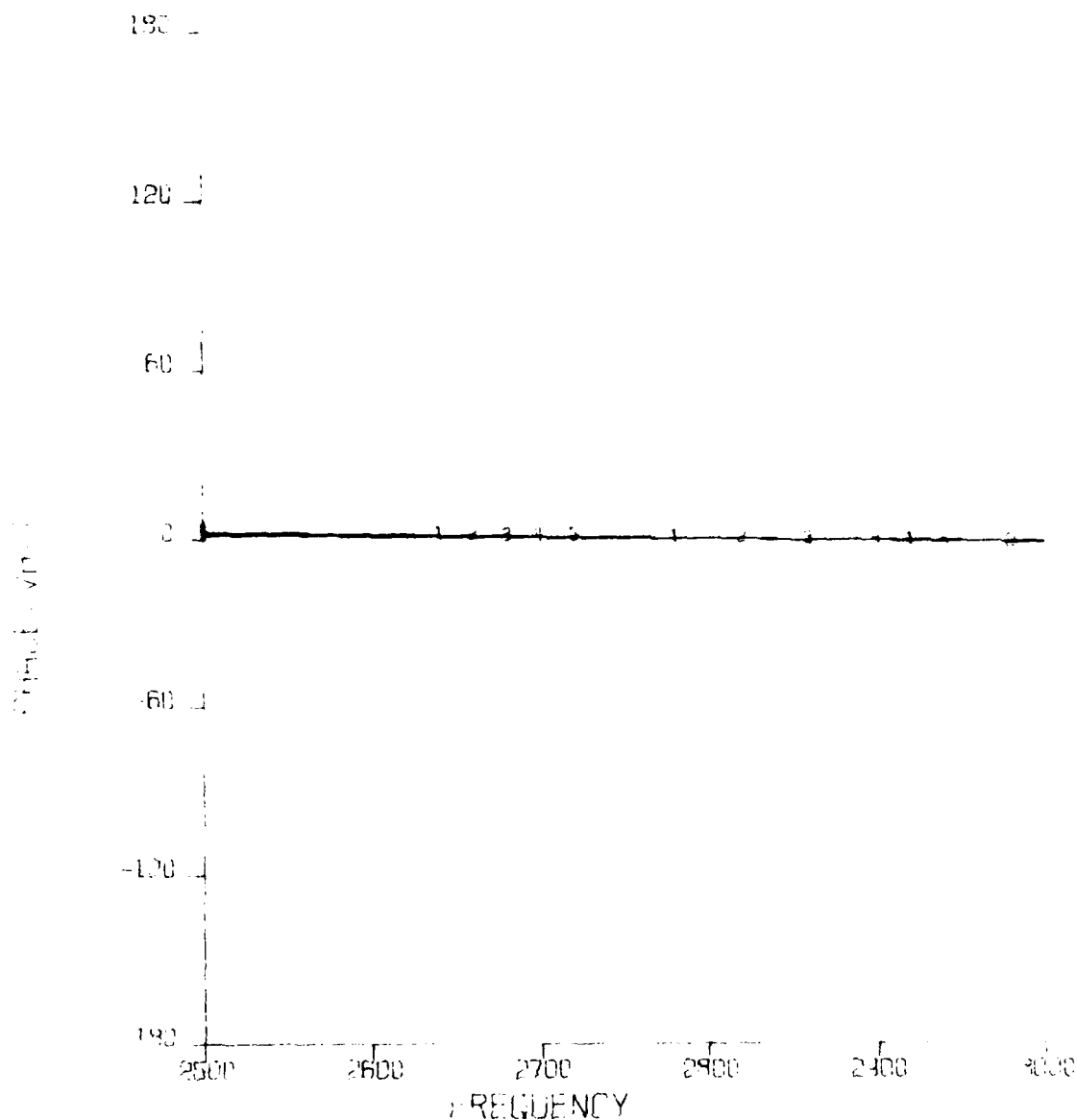
GE DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2762 GP=E+50 CS=.3373E-7 DS=0



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES = $1.65302281E04 + J8.10088049E03$
 CURVE 2 - MIN R = $3.57474880E03 + J9.01288749E03$
 CURVE 3 - MAX X = $-8.44770071E03 + J1.20617606E04$
 CURVE 4 - MIN X = $8.73845098E03 + J1.52407537E03$
 CURVE 5 - AVG = $3.82514457E03 + J6.38905526E03$

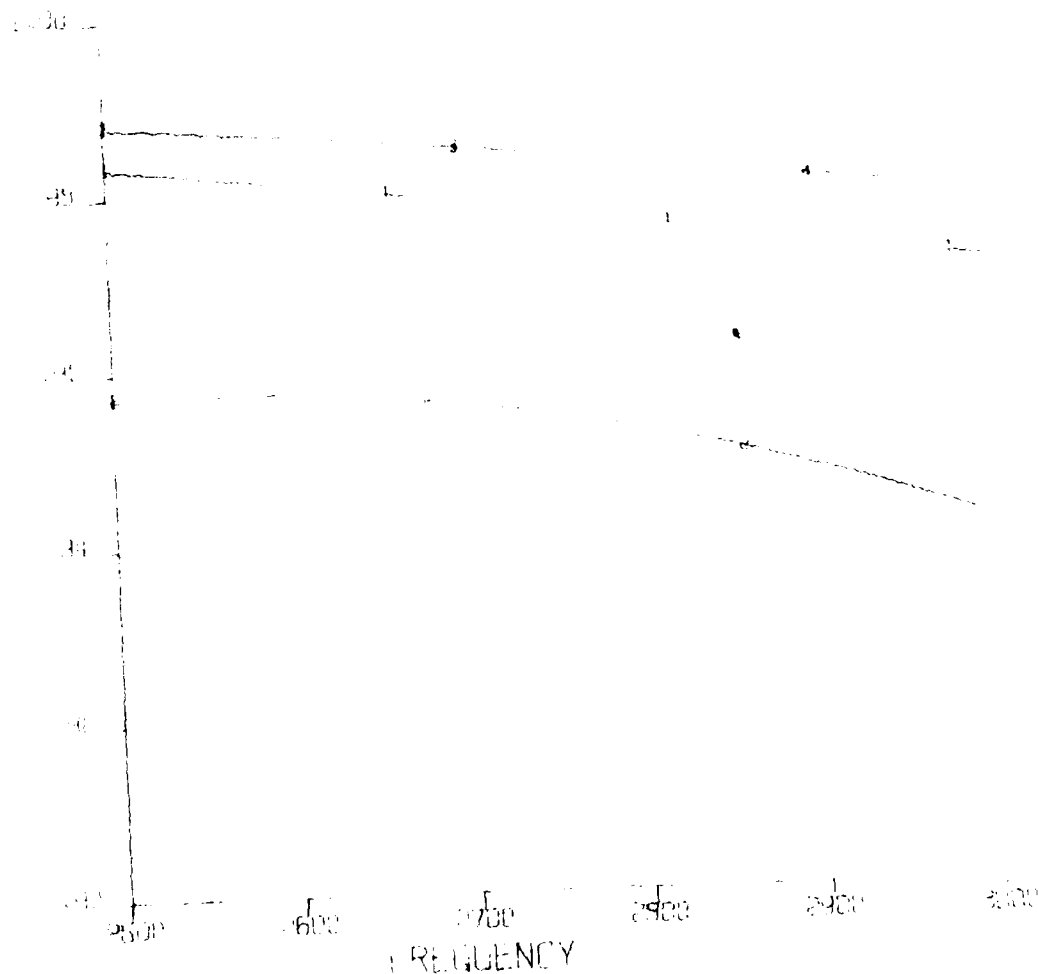
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 GP=E+50 CS=.3373E-7 DS=0



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04907449E03+J2.79989796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64526485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

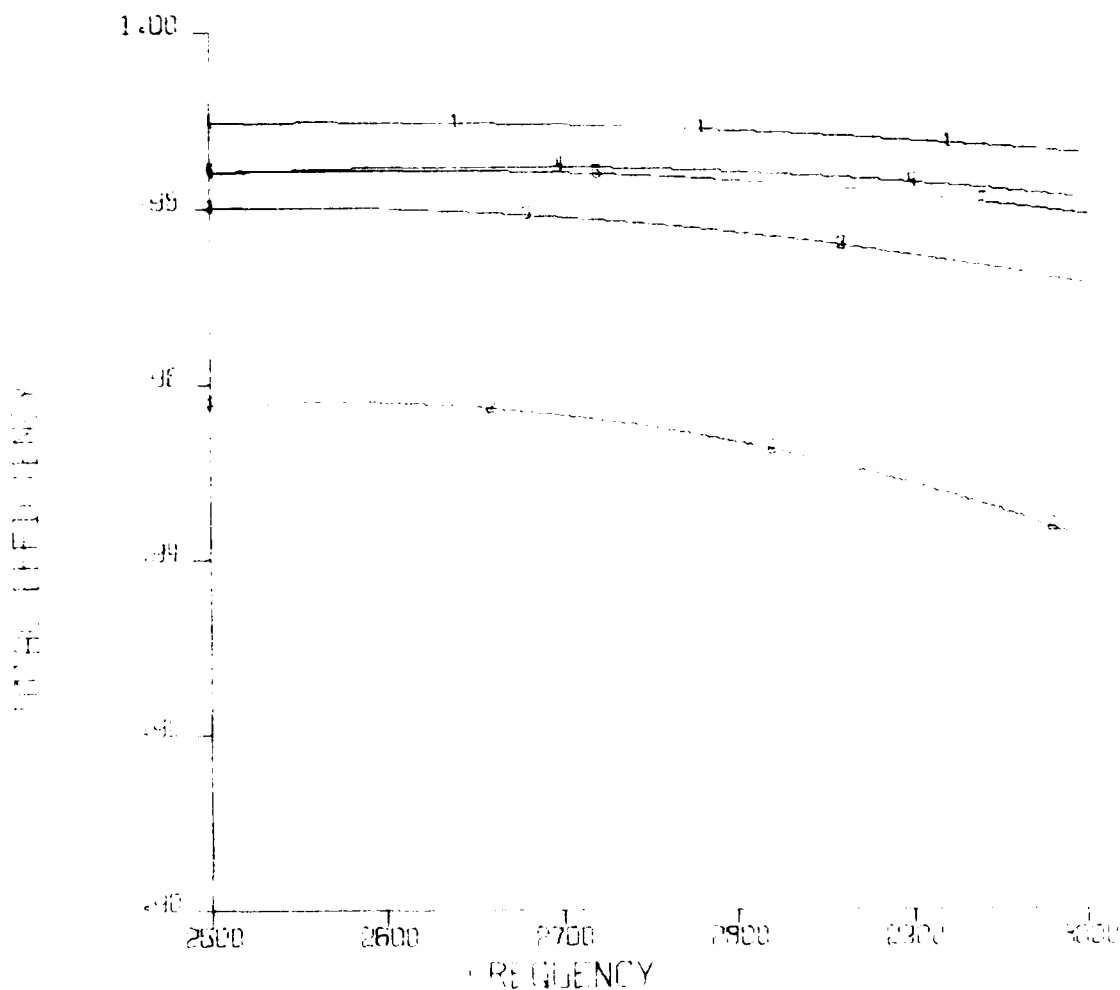
GE DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (G.61)
 LP=.2762 QP=E+50 CS=.33/31-7 DS=5



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRE 0.403970761E04+J8.48305170E04
 CURVE 2 - MIN R 2.350168917E03+J8.28721149E03
 CURVE 3 - AVG 3.0506520E04+J5.25791665E04

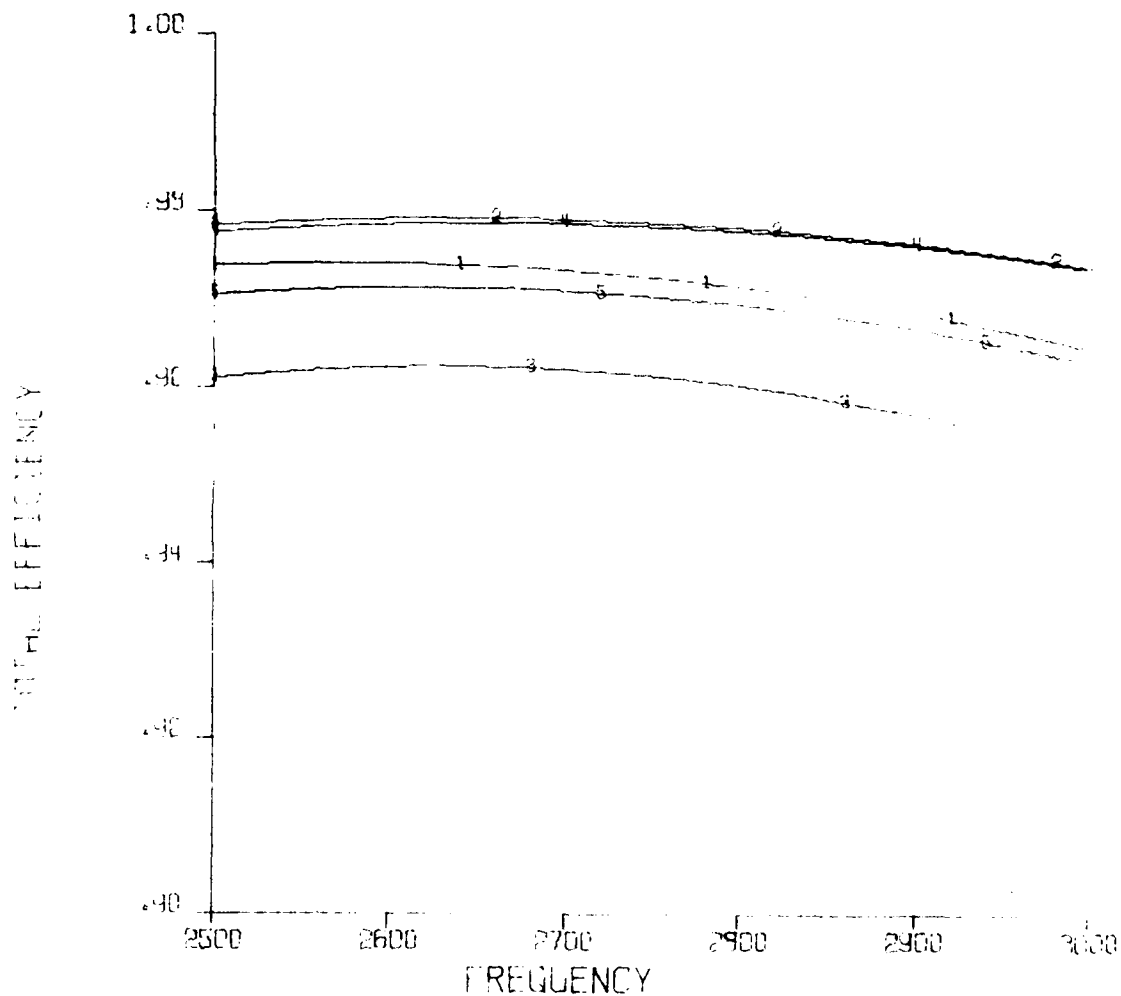
GE DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65307281E04+J8.10088048E03
 CURVE 2 - MIN R =3.12874885E03+J3.01288740E03
 CURVE 3 - MAX X =8.204770071E03+J1.20617606E04
 CURVE 4 - MIN X =4.73845096E03+J1.52307030E03
 CURVE 5 - AVG =9.80594457E03+J6.389005526E03

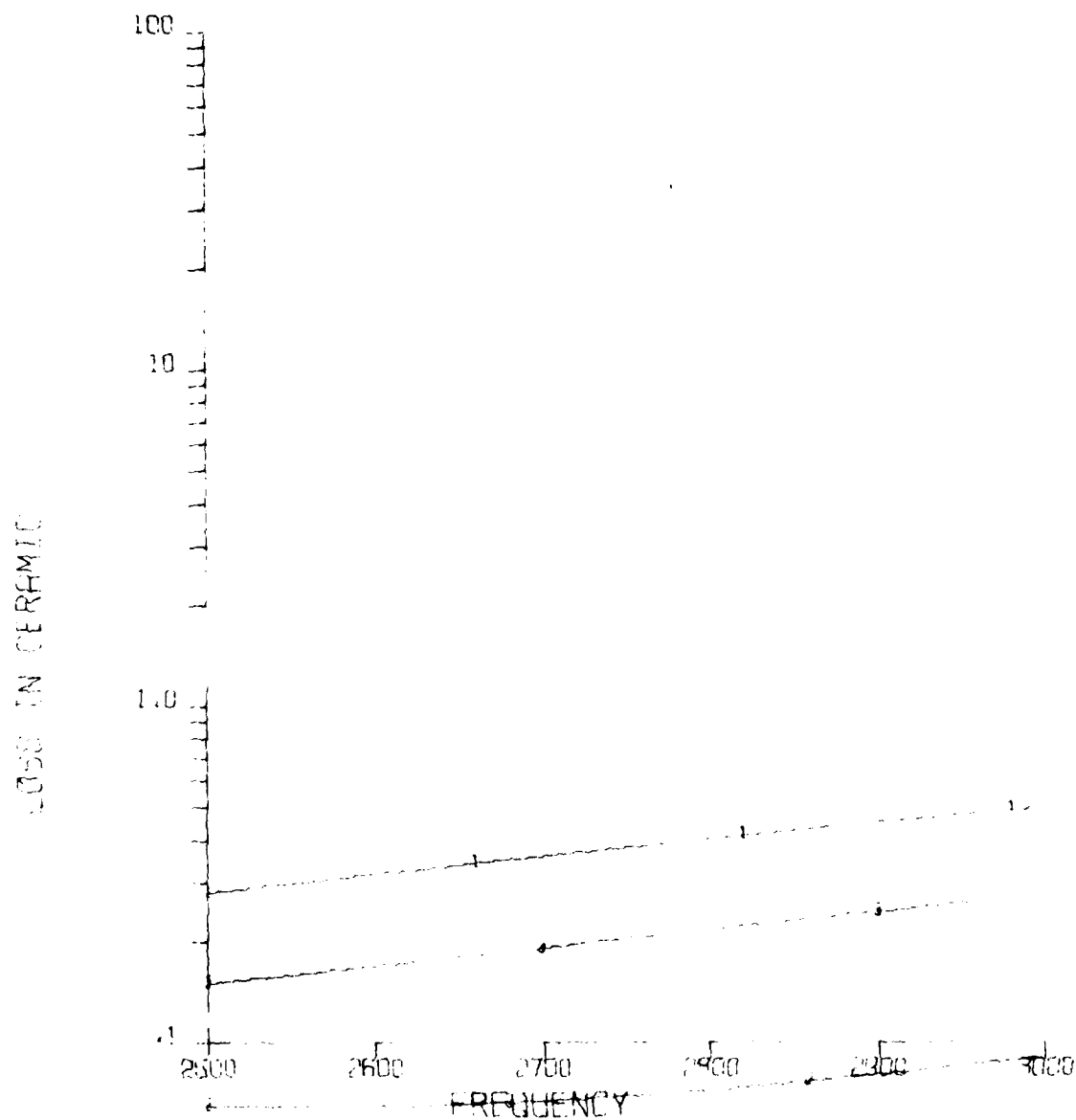
GE DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 UP=E+50 CS=.3373E-7 DS=0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985786E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03

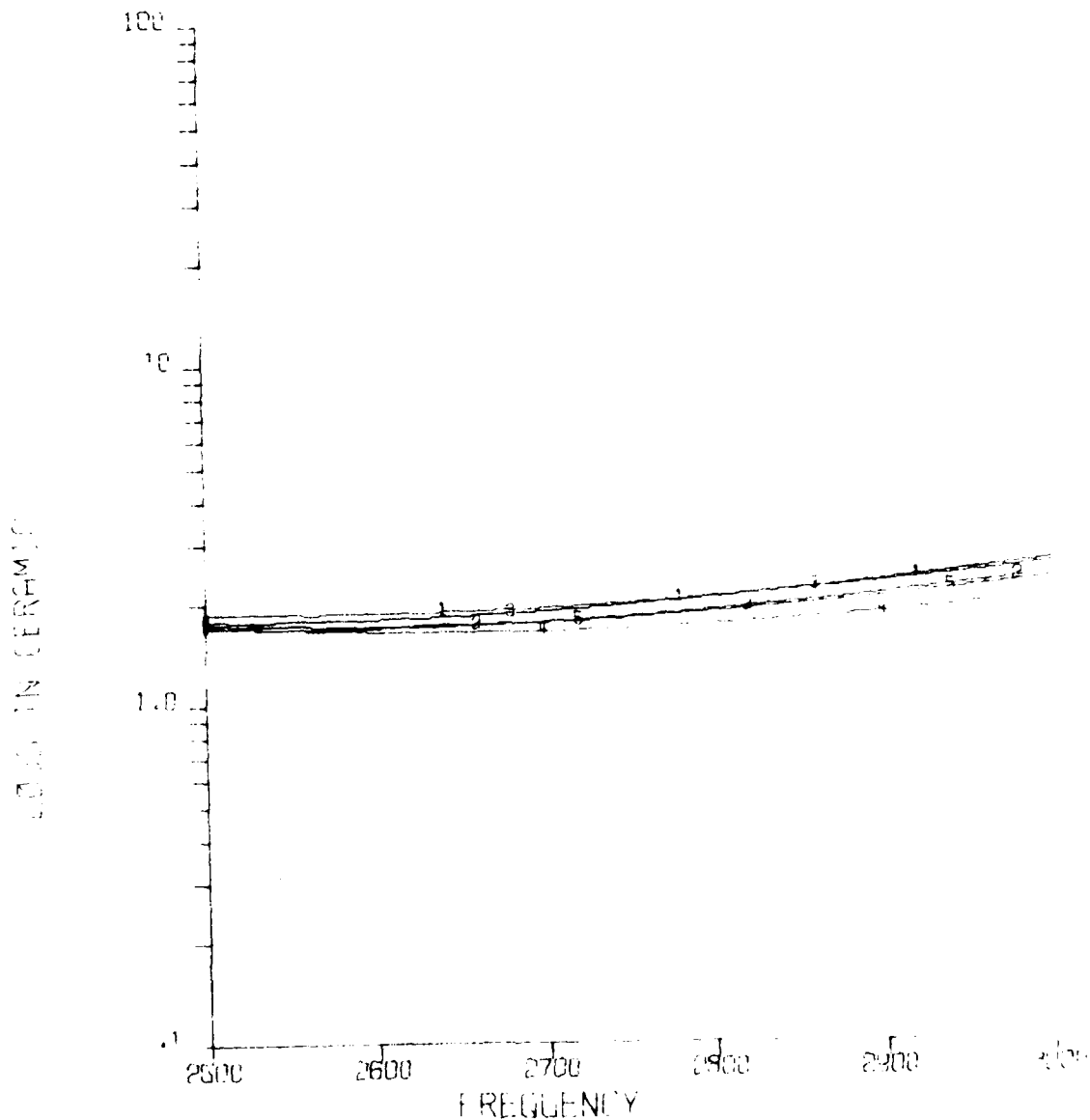
GE DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRS 4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R 3.50168917E03+J9.28737198E03
 CURVE 3 - AVG 3.05065037E04+J5.25781665E04

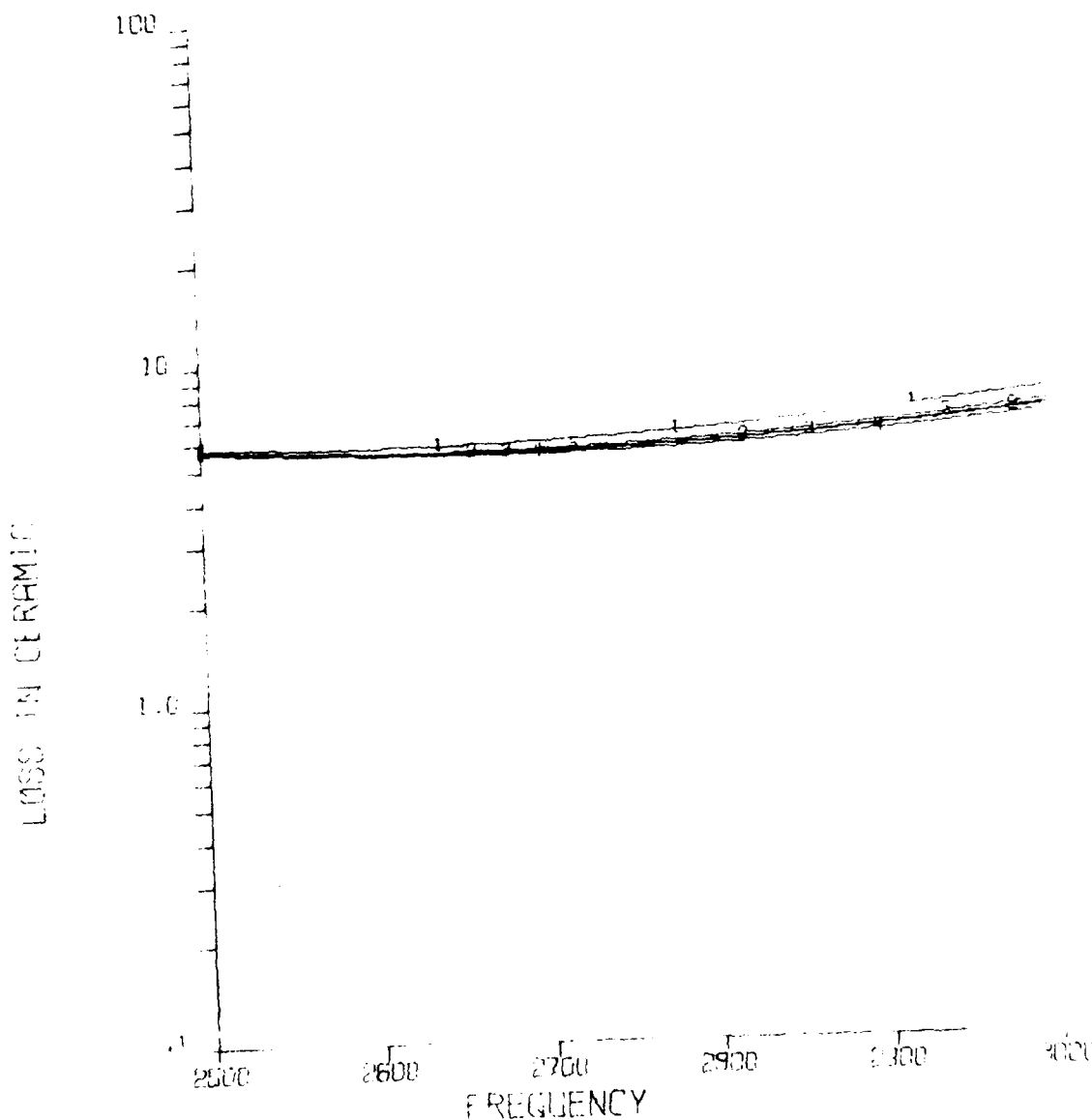
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10058048E03
 CURVE 2 - MIN R =3.53874850E03+J3.01288730E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73845096E03+J1.82307471E04
 CURVE 5 - AVG =8.98594457E03+J6.38905526E03

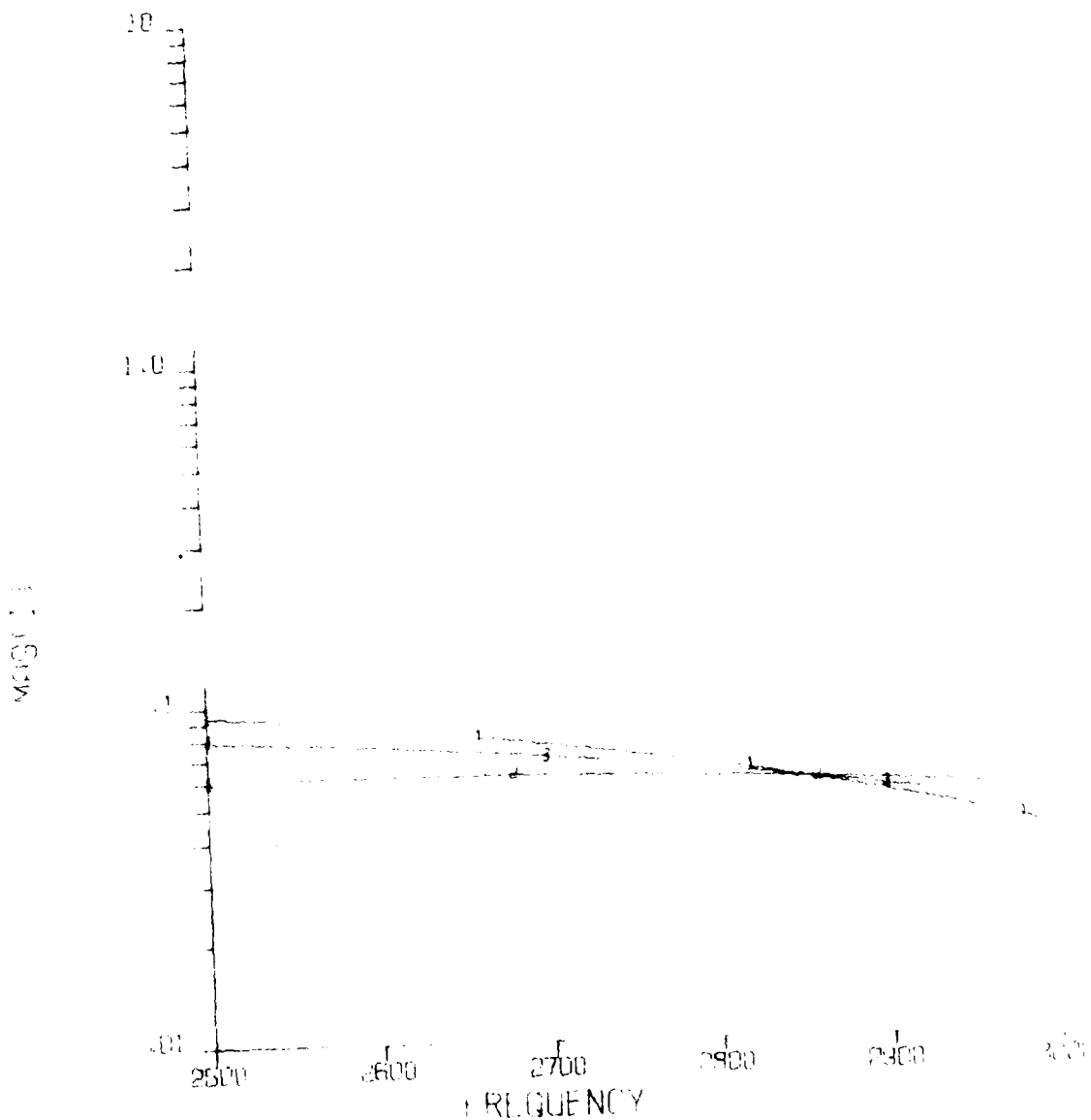
GE DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0,90)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.75985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678979E03

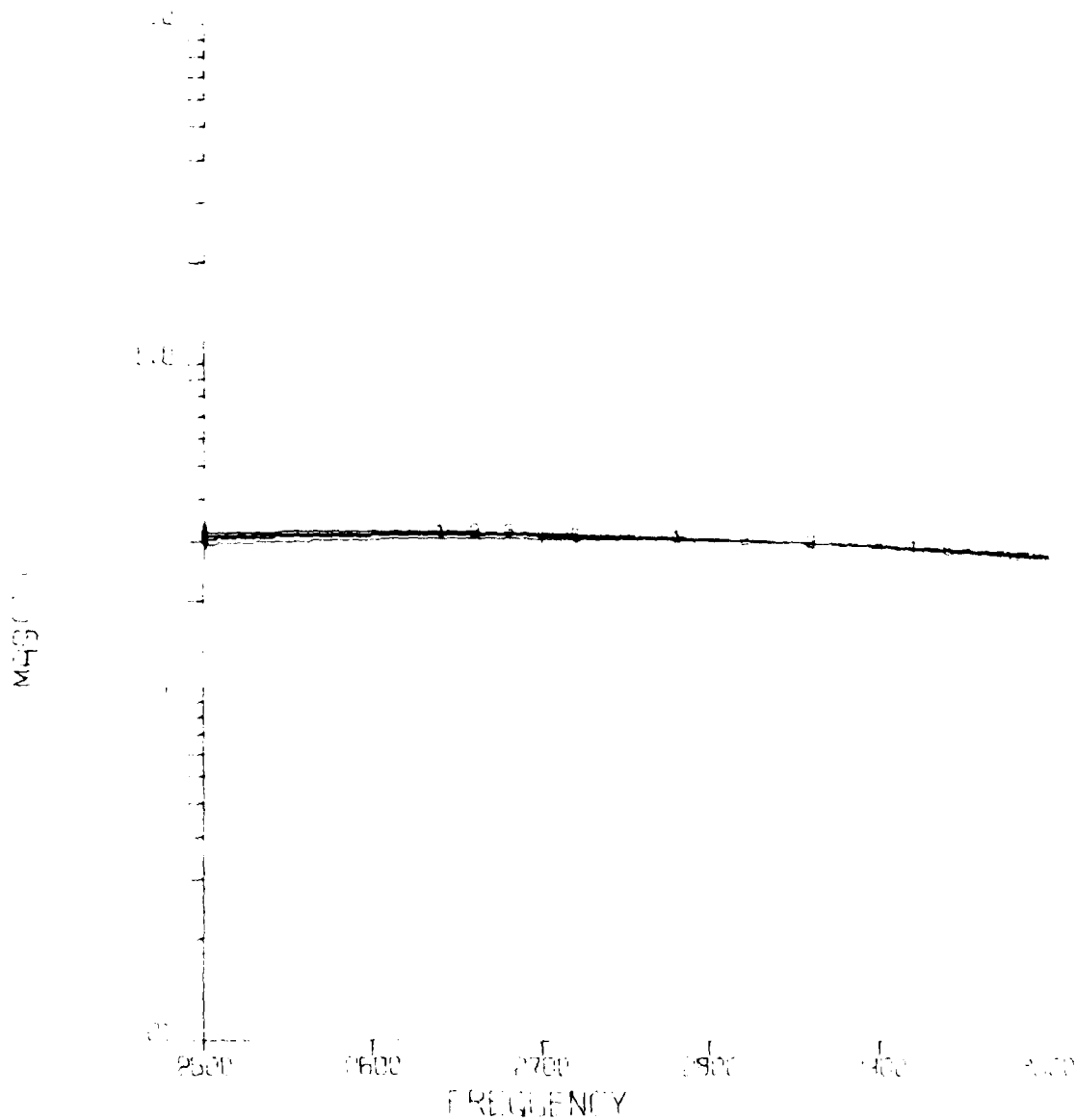
CE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (G.O)
 LP=.2762 QP=E+5G CS=.3373E-7 DS=0



MAG (1) VERSUS FREQUENCY

CURVE 1 - MAX PRE $4.03970761E04 + J8.4830307E04$
 CURVE 2 - MIN R $-3.50169017E03 + J9.2873108E03$
 CURVE 3 - AVG $-3.05065992E04 + J5.2578166E04$

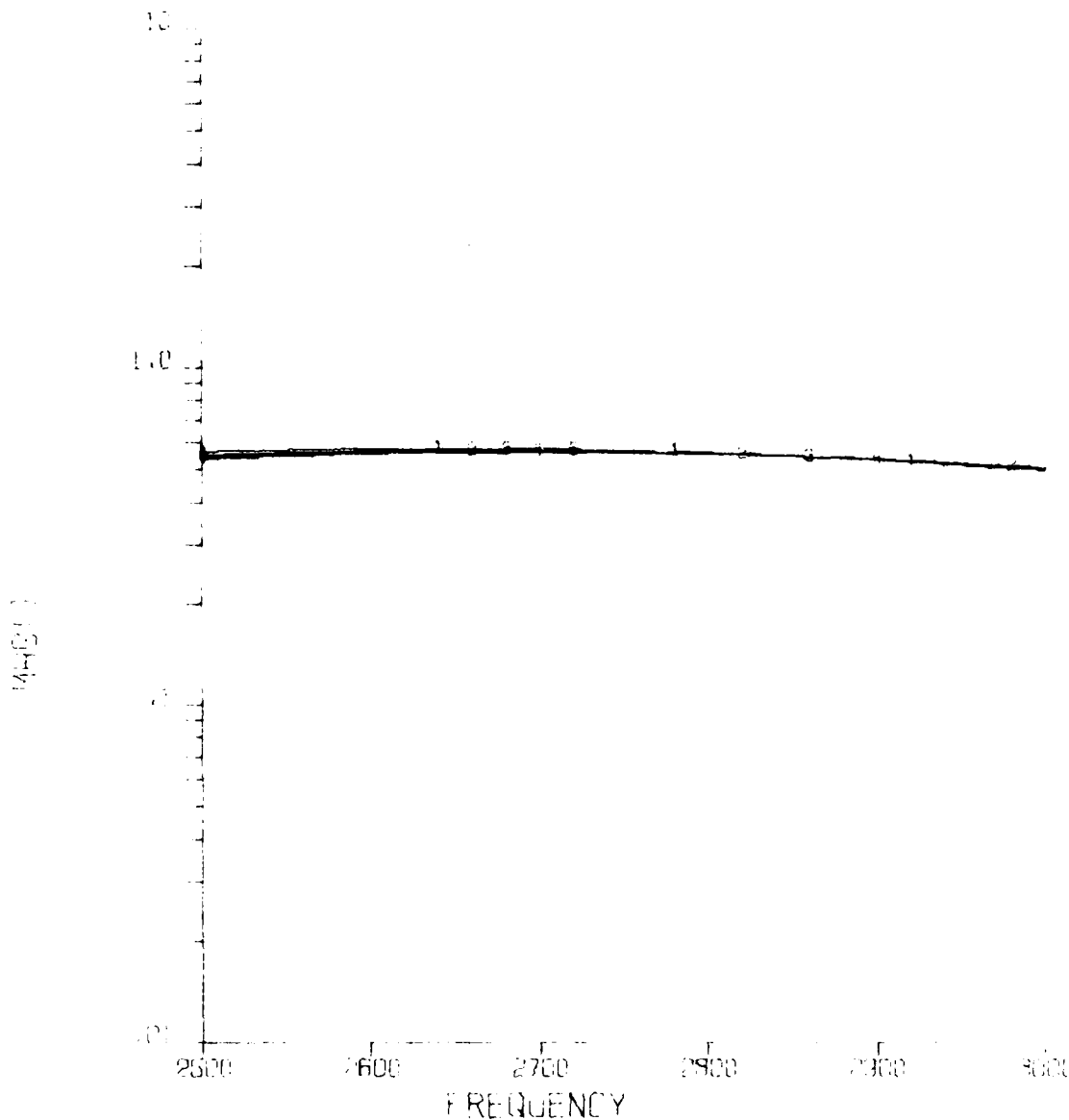
GE DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=-.2762 GP=E+50 CS=-.3373E-7 DS=0



MAG (1) VERSUS FREQUENCY

CURVE 1	MAX	PRE	SE	1.85307081E+04+J8.10088048E+03
CURVE 2	MIN	R		3.25387488E+03+J9.01288734E+03
CURVE 3	MAX	X		8.44770071E+03+J1.20617609E+04
CURVE 4	MIN	X		9.17384509E+03+J1.59307134E+03
CURVE 5	PVS			9.29154447E+03+J6.25405596E+03

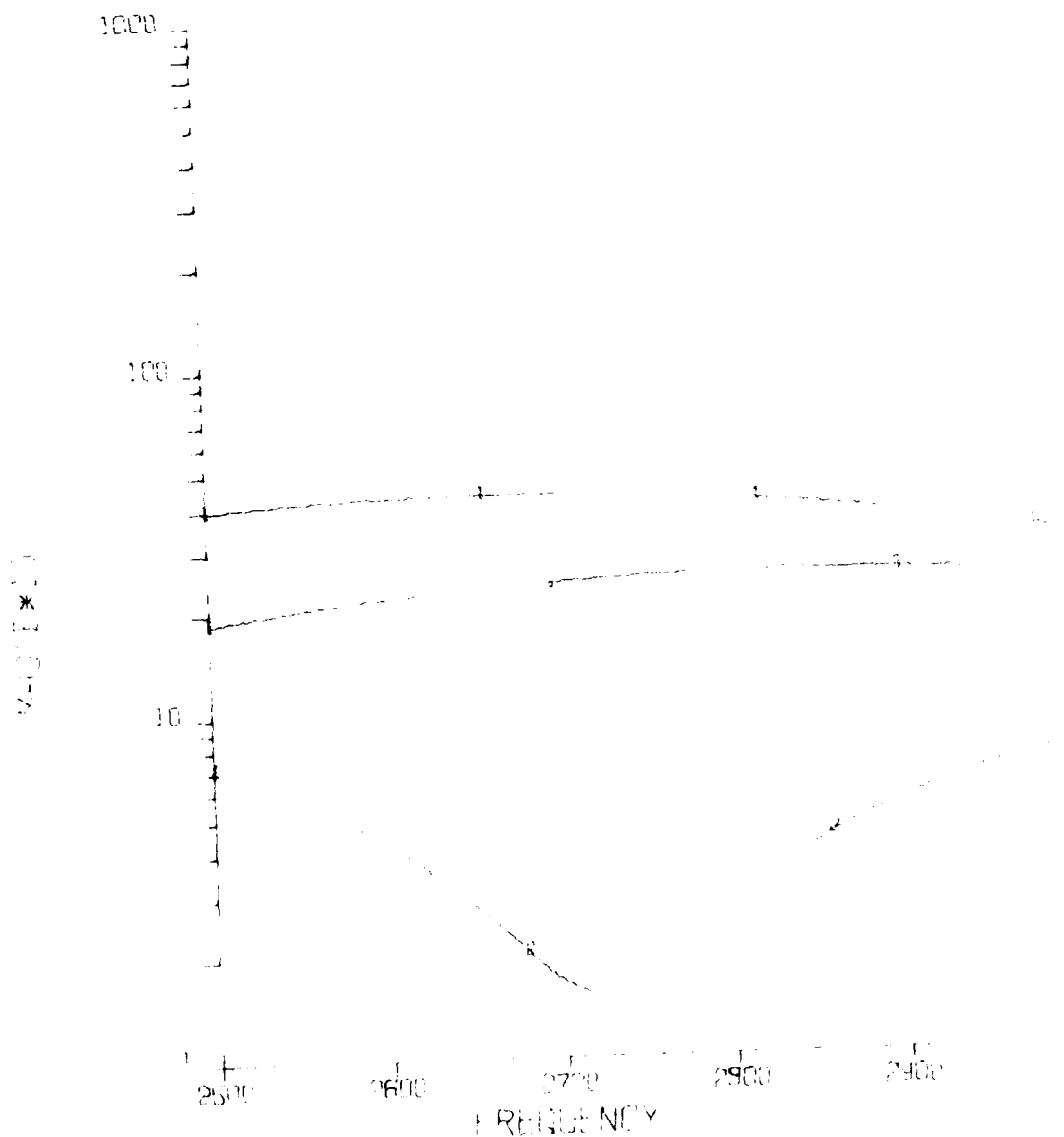
GE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 UP=E+50 CS=.3373E-7 DS=0



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301818E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985786E03
 CURVE 3 - MIN R =3.78636591E03+J3.64529485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41085003E03
 CURVE 5 - MIN =5.07857123E03+J4.58678978E03

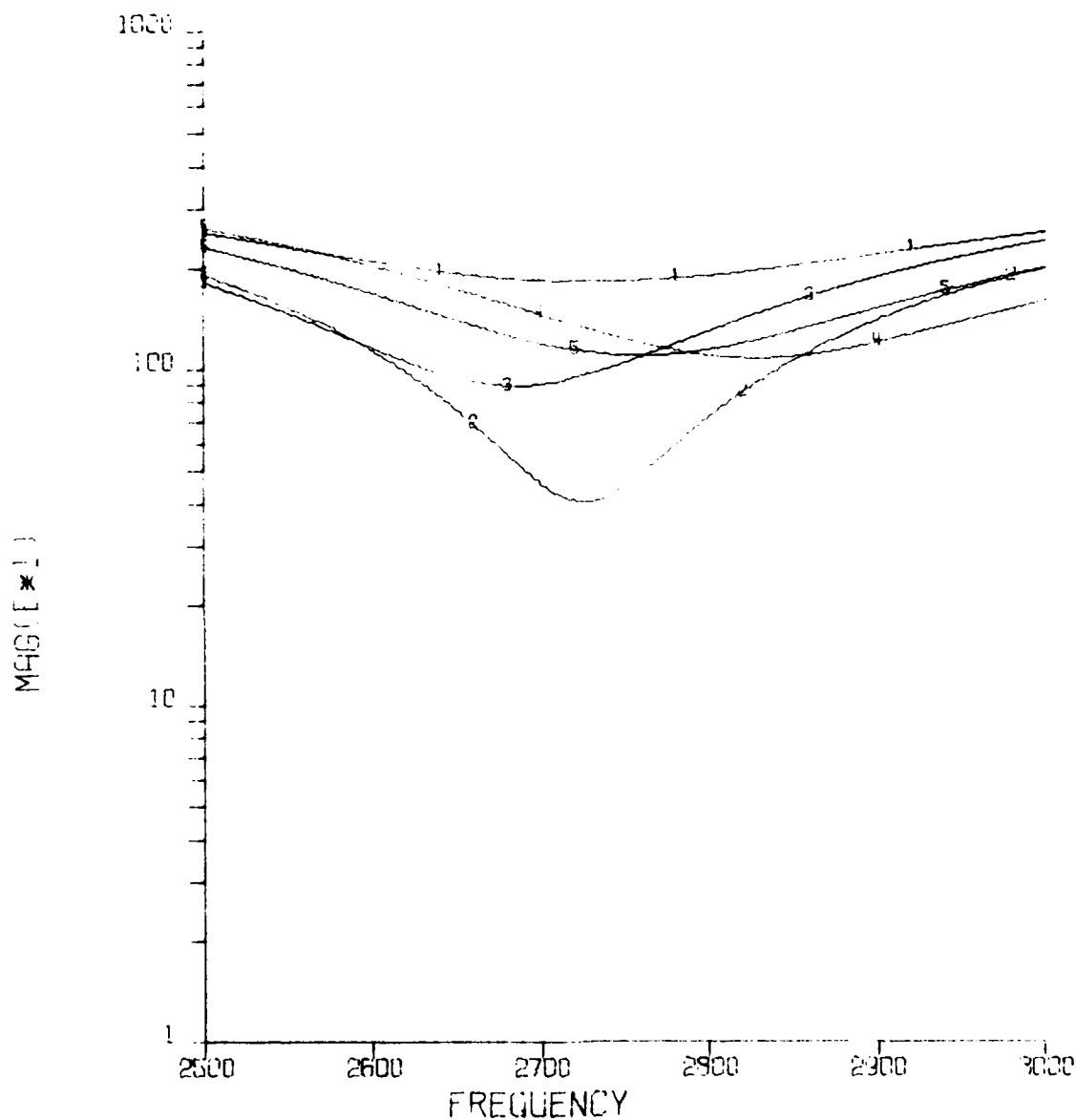
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2762 GP=E+5G CS=.3373E-7 DS=0



MAGNITUDE VERSUS FREQUENCY

CURVE 1 - MAX PREDICTION
 CURVE 2 - MIN PREDICTION
 CURVE 3 - AVG PREDICTION

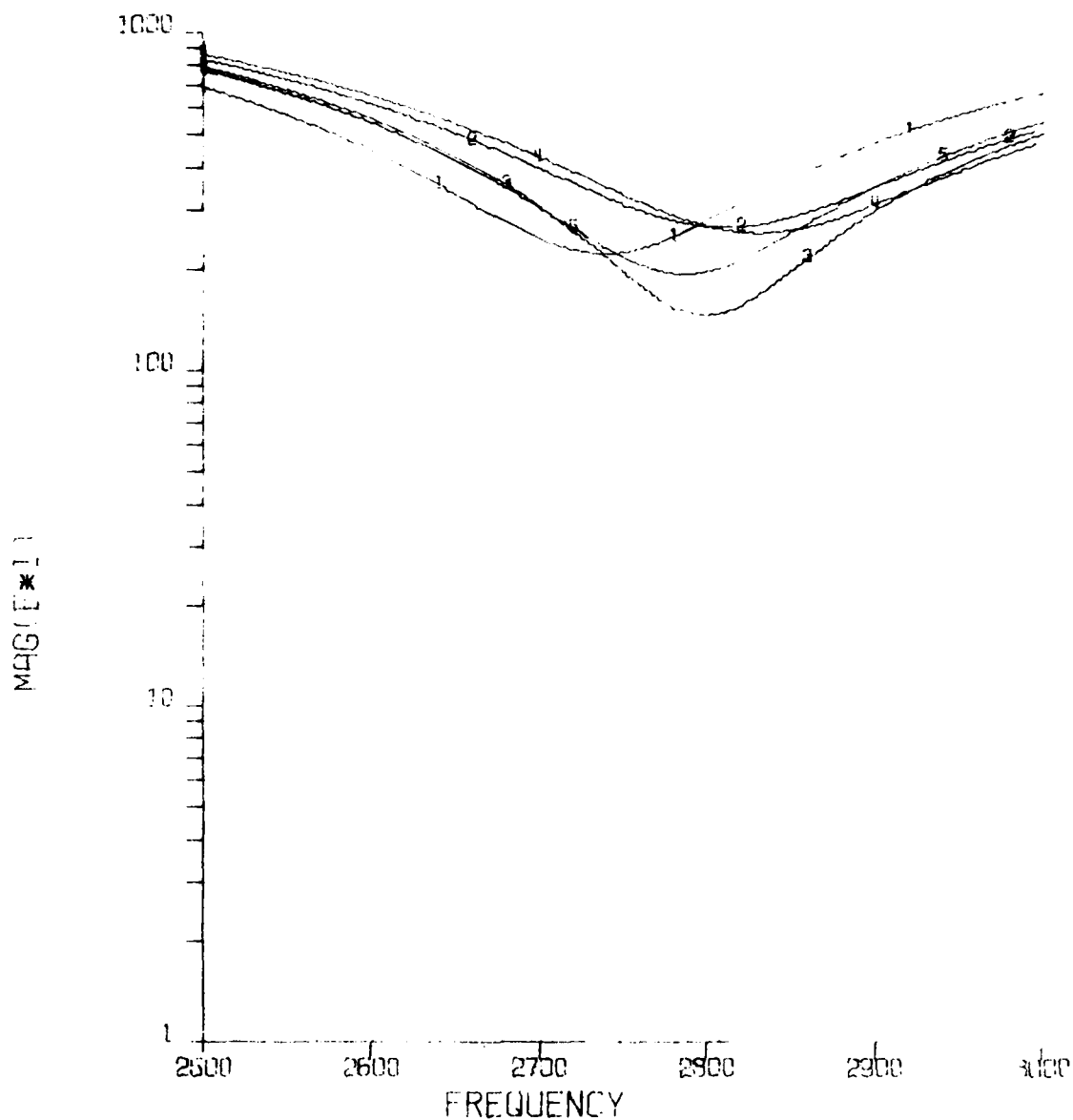
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0,30)
 P=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 - MIN R =3.53874880E03+J9.01286799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73845096E03+J1.52307533E03
 CURVE 5 - AVG =9.89594457E03+J6.38905526E03

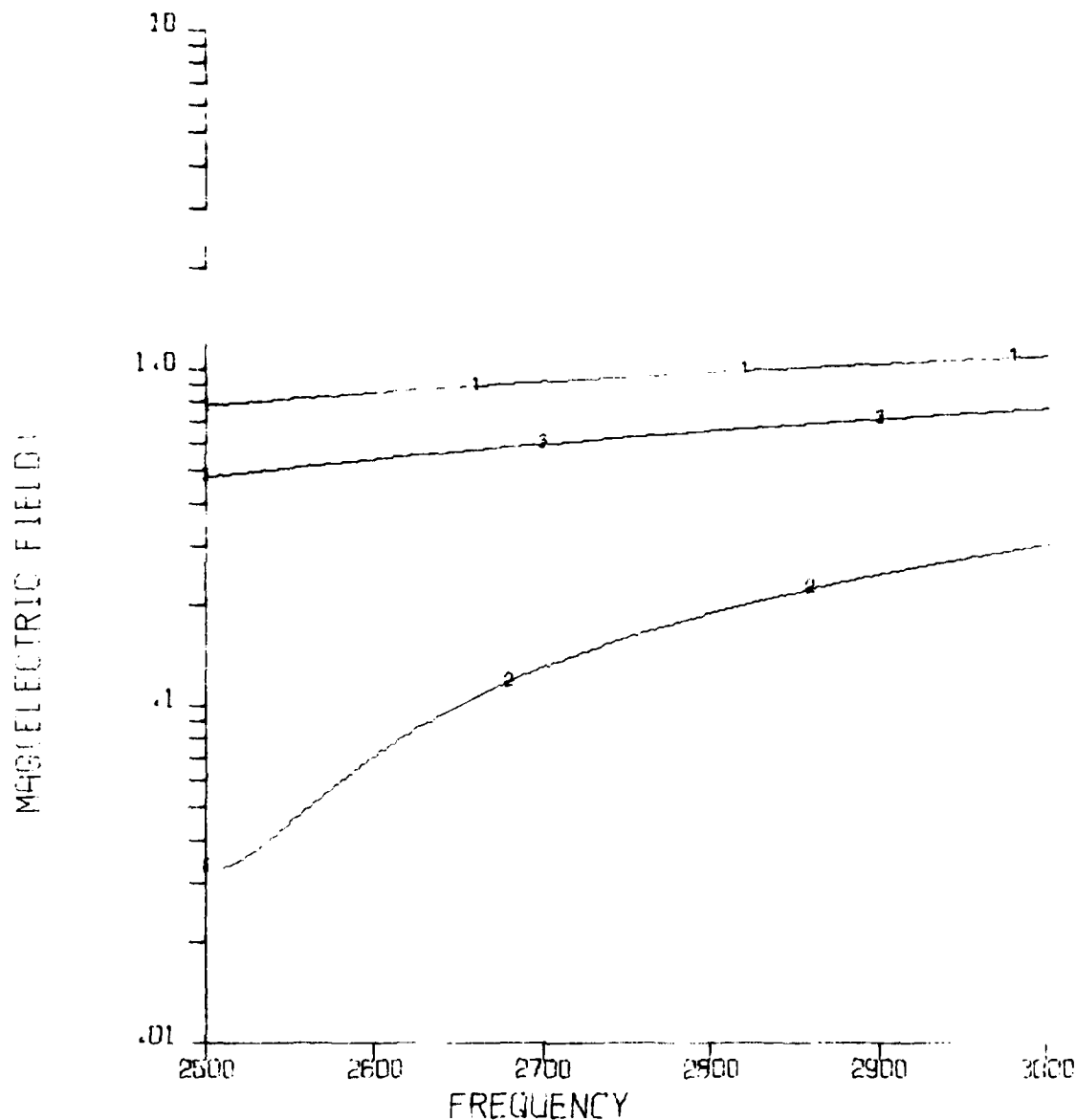
GE DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0,90)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - HVB =5.07857123E03+J4.58678978E03

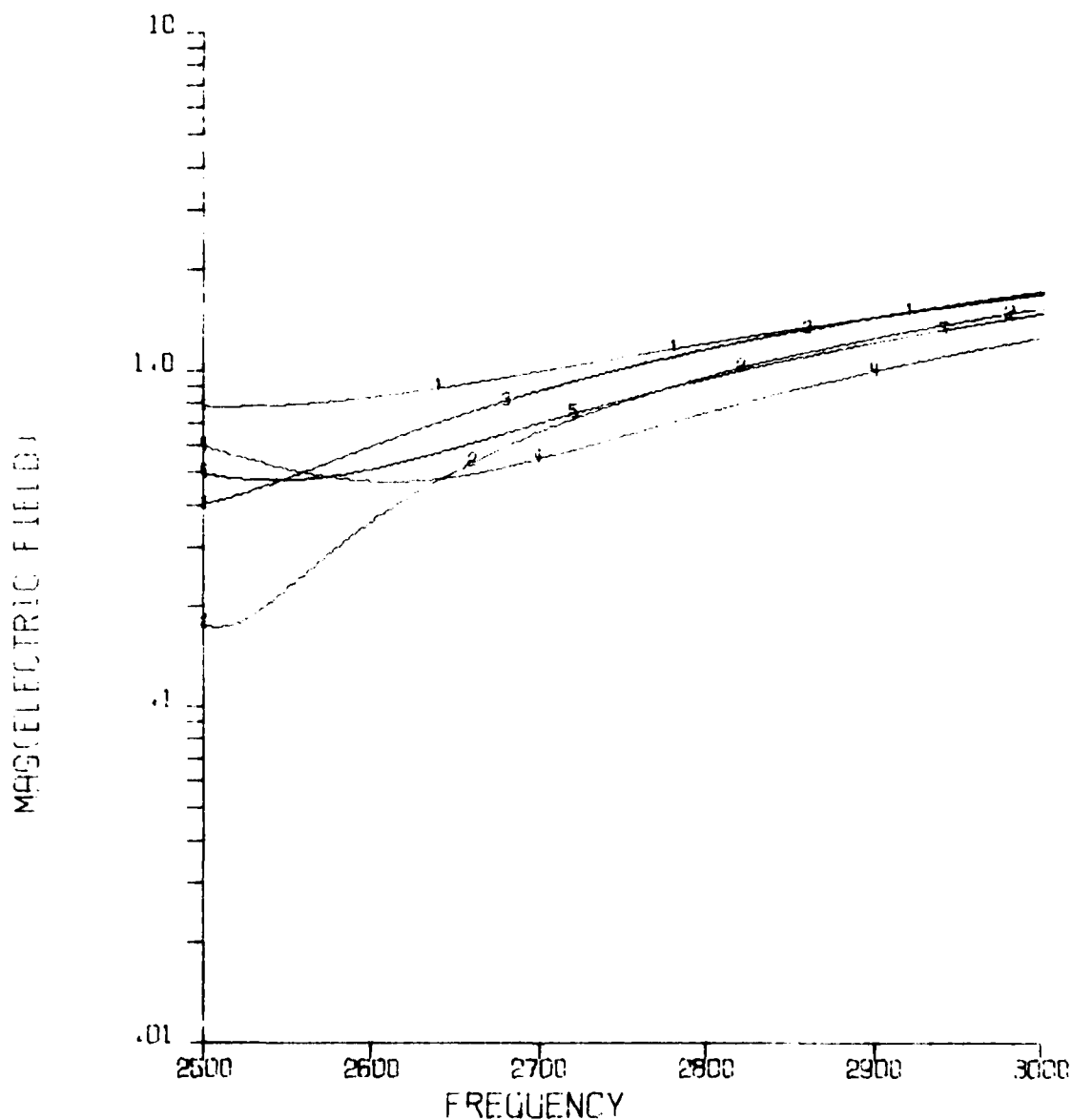
GE DUMILCAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAG(ELECTRIC FIELD) VERSUS FREQUENCY

CURVE 1 - MAX PRES=4.03970761E04+J8.48303975E04
 CURVE 2 - MIN R =3.50168917E03+J9.28735198E03
 CURVE 3 - AVG =3.05065992E04+J5.25781665E04

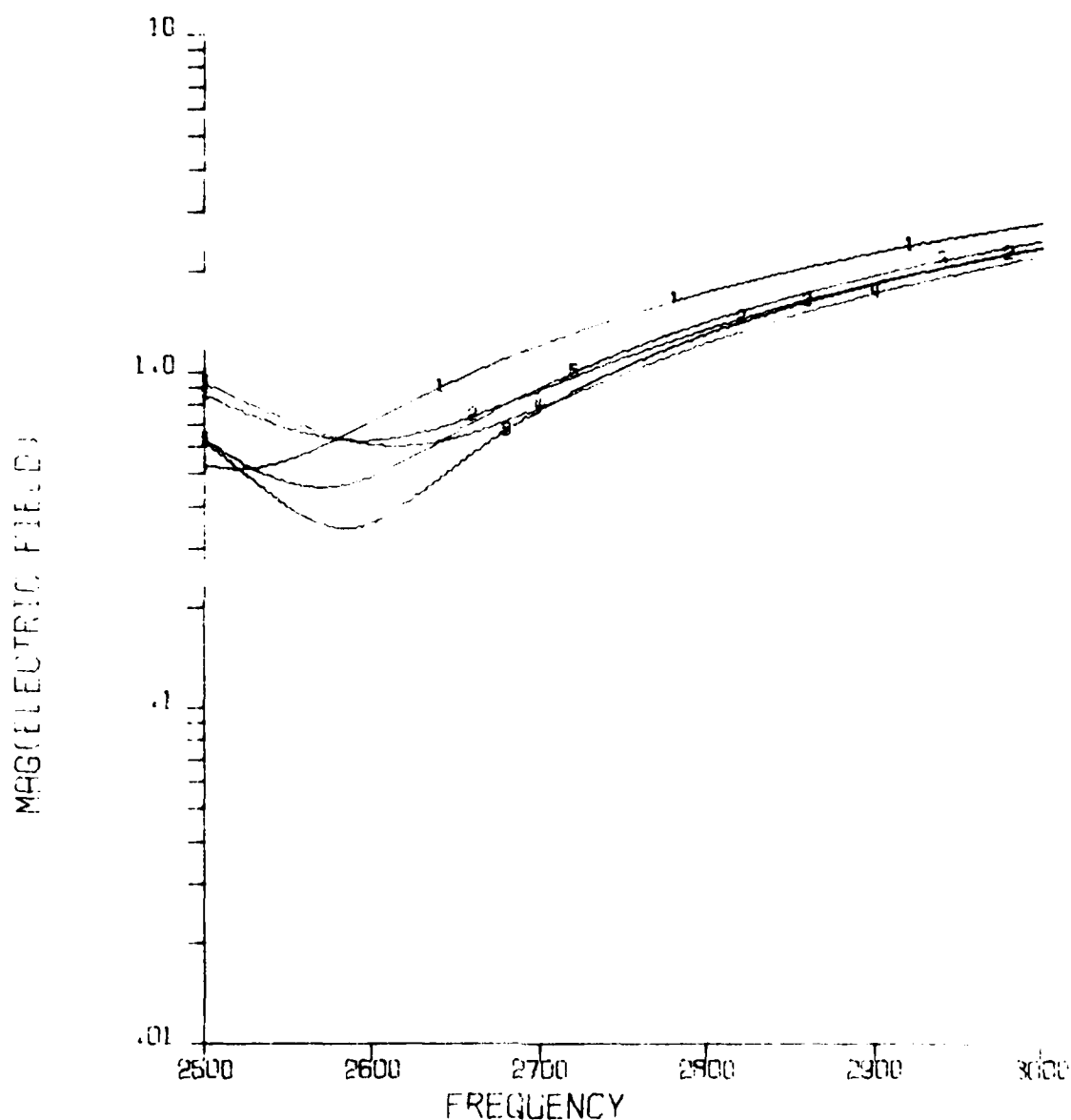
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0,30)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAGNETIC FIELD) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.65302281E04+J8.10088048E03
 CURVE 2 - MIN R =3.53874880E03+J9.01288799E03
 CURVE 3 - MAX X =8.44770071E03+J1.20617606E04
 CURVE 4 - MIN X =9.73945096E03+J1.52307533E03
 CURVE 5 - AVG =9.89594457E03+J6.38905526E03

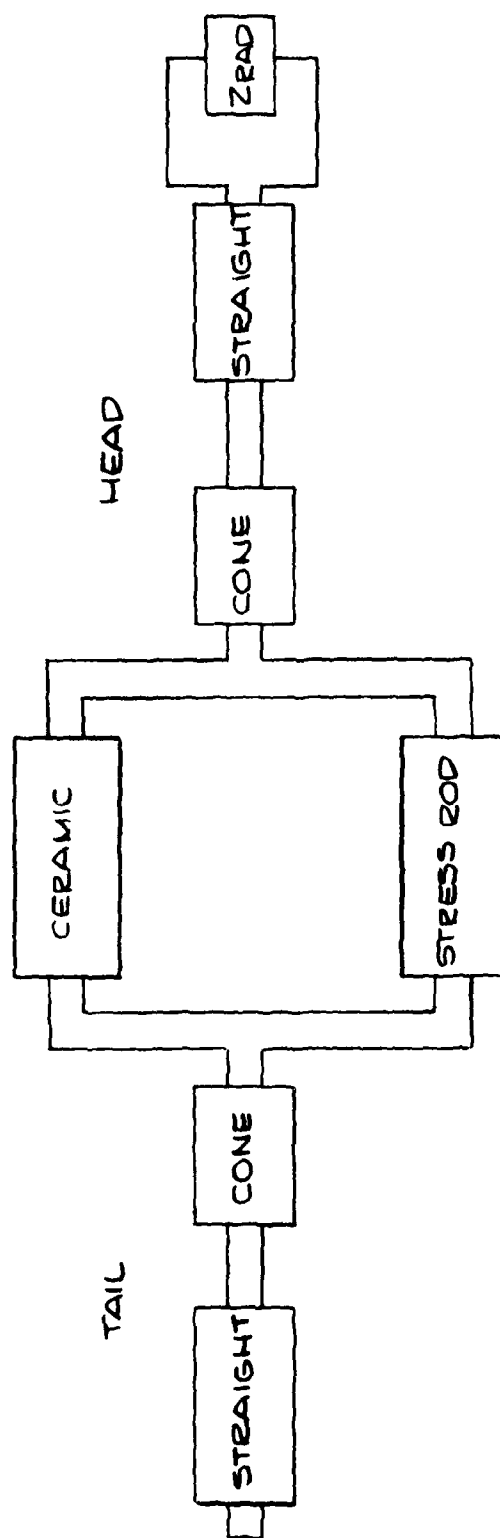
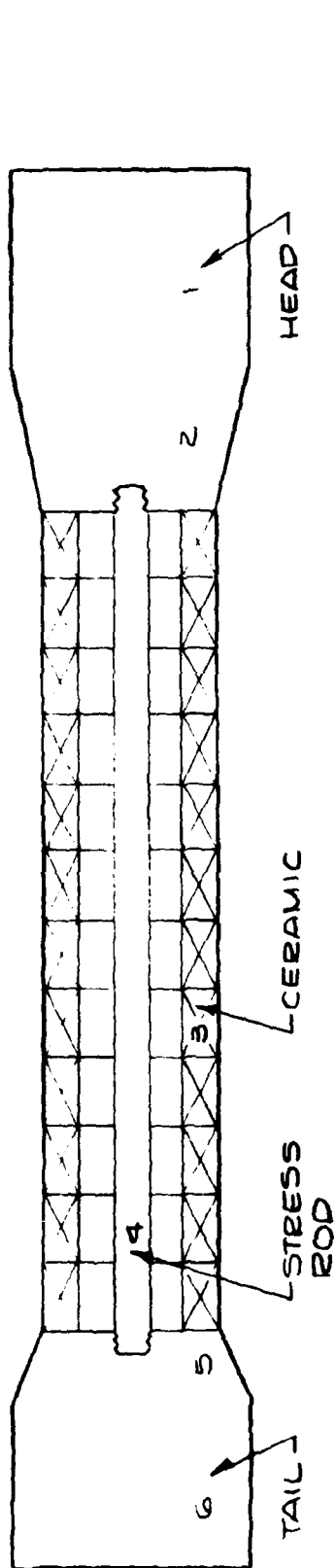
GE DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.2762 QP=E+50 CS=.3373E-7 DS=0



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX	PRES=5.83226748E03+J8.12301916E03
CURVE 2 - MAX R	=7.04807449E03+J2.79985796E03
CURVE 3 - MIN R	=3.78636591E03+J3.64525485E03
CURVE 4 - MIN X	=6.77634102E03+J1.41083003E03
CURVE 5 - AVG	=5.07857123E03+J4.58678978E03

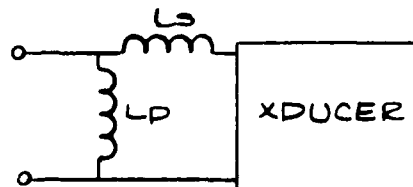
TRC



TRG DUMILOAD I

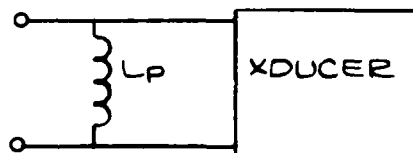
TRG
DUMILOAD I.C.P.I
5 INCH CIRCULAR HEAD

LOW BAND



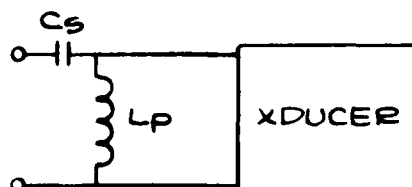
$$\begin{aligned} L_s &= 1.887103155 \times 10^{-1} & Q_s &= 10^{50} \\ L_p &= 4.483342685 \times 10^{-1} & Q_p &= 10^{50} \end{aligned}$$

MID BAND



$$L_p = 4.155114380 \times 10^{-1} \quad Q_p = 10^{50}$$

HIGH BAND



$$\begin{aligned} L_p &= 3.013337770 \times 10^{-1} & Q_p &= 10^{50} \\ C_s &= 1.9490373 \times 10^{-8} & D_s &= 0.0 \end{aligned}$$

DATE 4/15/66

RUN NUMBER 2-33-0023-4

NON-PIEZOELECTRIC MATERIAL PARAMETERS
ACTIVE TRANSDUCER
CURRENT CONTROL

SECTION NAME	PIECE NO.	PIECE TYPE	DENSITY	LENGTH	LEFT AREA	RIGHT AREA	LONGITUDINAL VEL. OF SOUND
TAIL	1	0	7.700000E 03	1.086900E-01	1.026100E-02	1.026100E-02	5.051000E 03
	2	1	7.700000E 03	2.540000E-02	1.026100E-02	4.500400E-03	5.051000E 03
STRESS ROD	1	0	7.700000E 03	2.286000E-01	1.979300E-04	1.979300E-04	5.051000E 03
	2	0	7.700000E 03	6.350000E-03	1.266800E-02	1.266800E-02	5.051000E 03
HEAD	1	1	7.700000E 03	4.520200E-02	4.560400E-03	1.266800E-02	5.051000E 03
	2	0	7.700000E 03	6.350000E-03	1.266800E-02	1.266800E-02	5.051000E 03

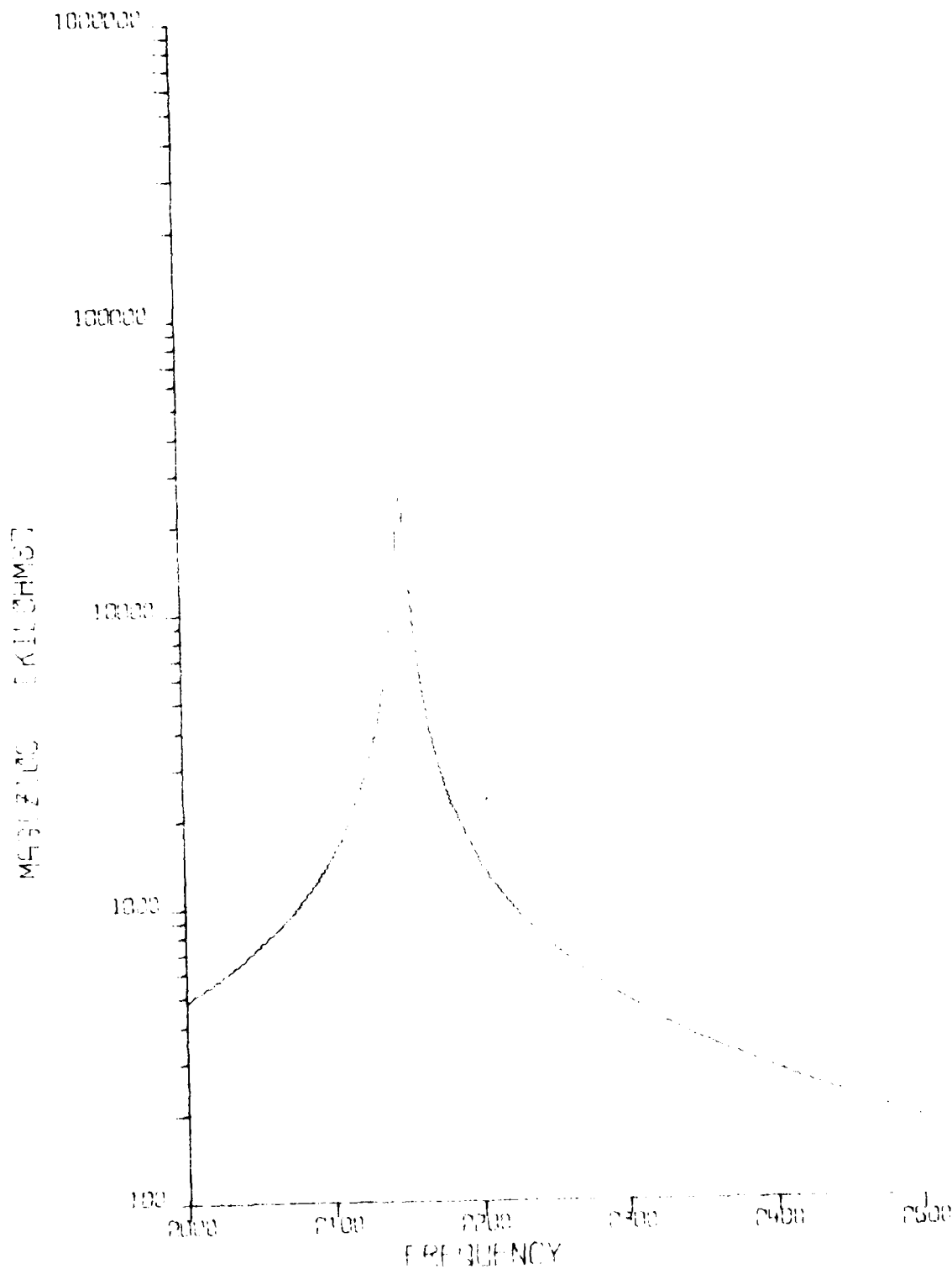
INPUT PARAMETERS FOR TRANSDUCER ANALYSIS
ACTIVE CERAMIC PARAMETERS

S3333		G333		E333	
REAL	IMAGINARY	REAL	IMAGINARY	REAL	IMAGINARY
1.020550E-11	-2.480957E-14	2.279840E-02	1.744300E-05	1.250360E 03	-2.929464E 03
NO. OF RINGS		AREA		LENGTH	
12		7.440000E 03		1.905000E-02	

TRACOR, INC.

LOW BAND

TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND
 LS=.1887 QS=E+50 LP=.4483 QP=+50



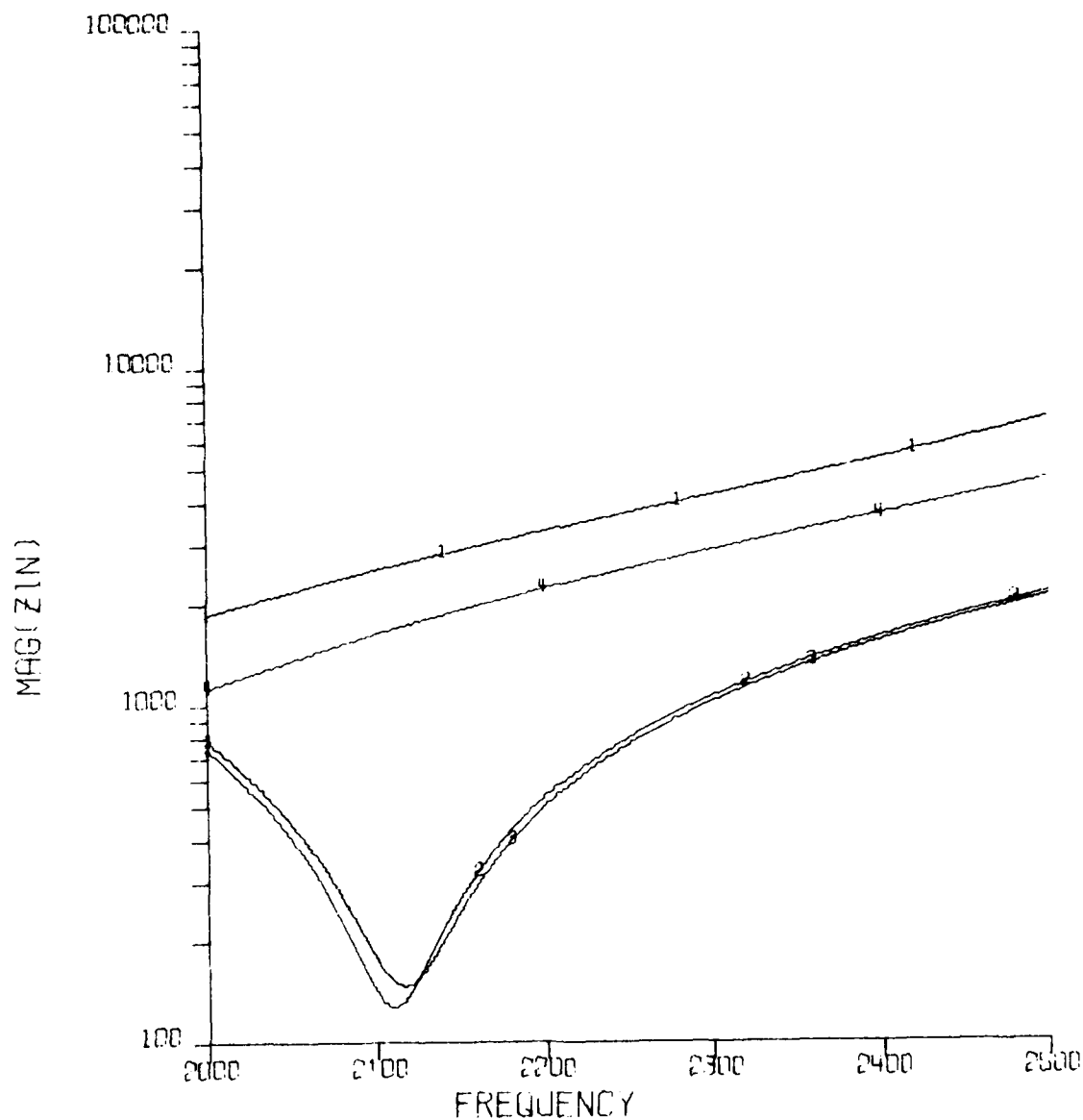
MAGZTDC VERSUS FREQUENCY

LS=.1887 QS=E+50 LP=.4483 QP=+50



MAGNETIC VERSUS FREQUENCY

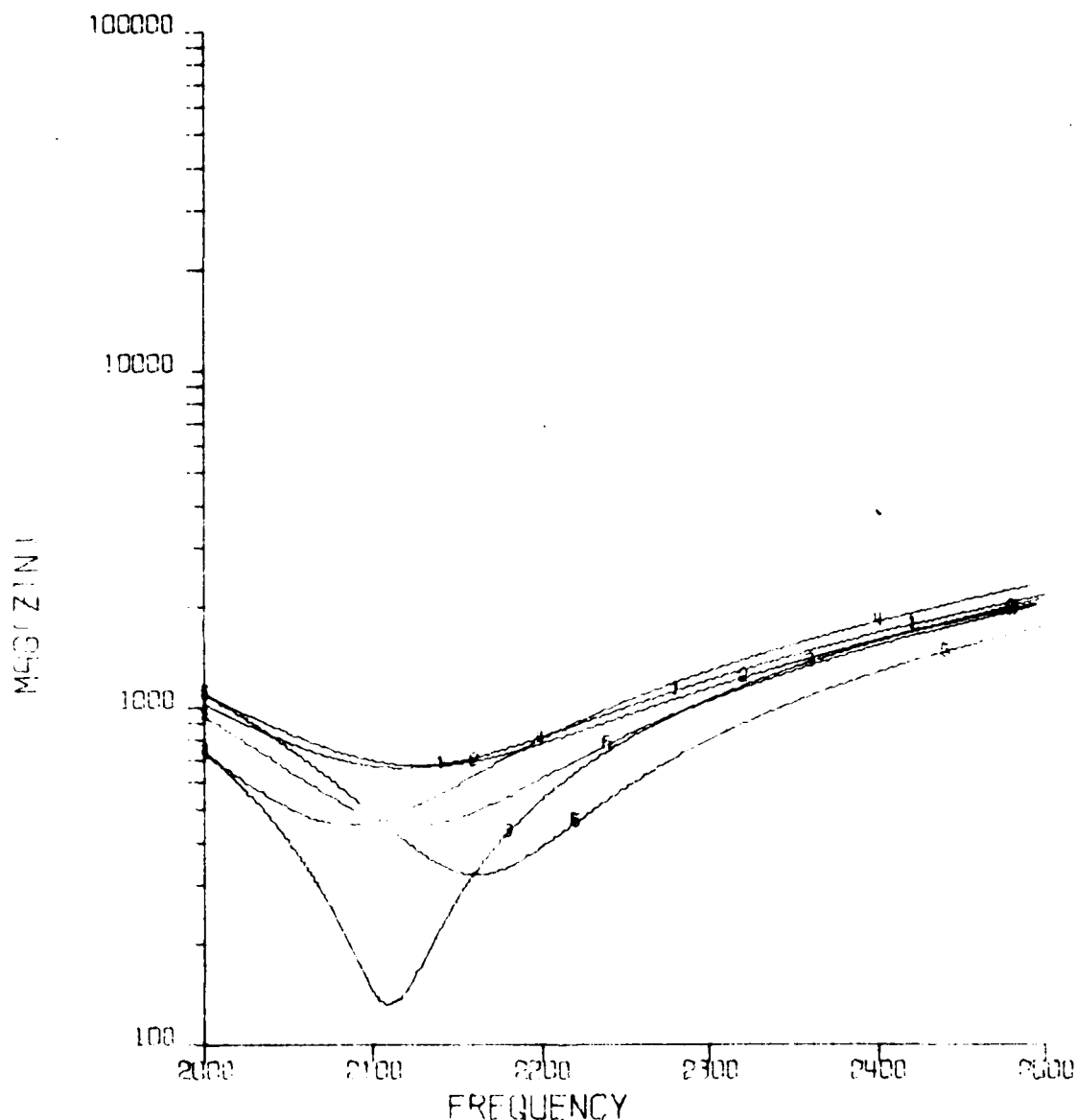
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

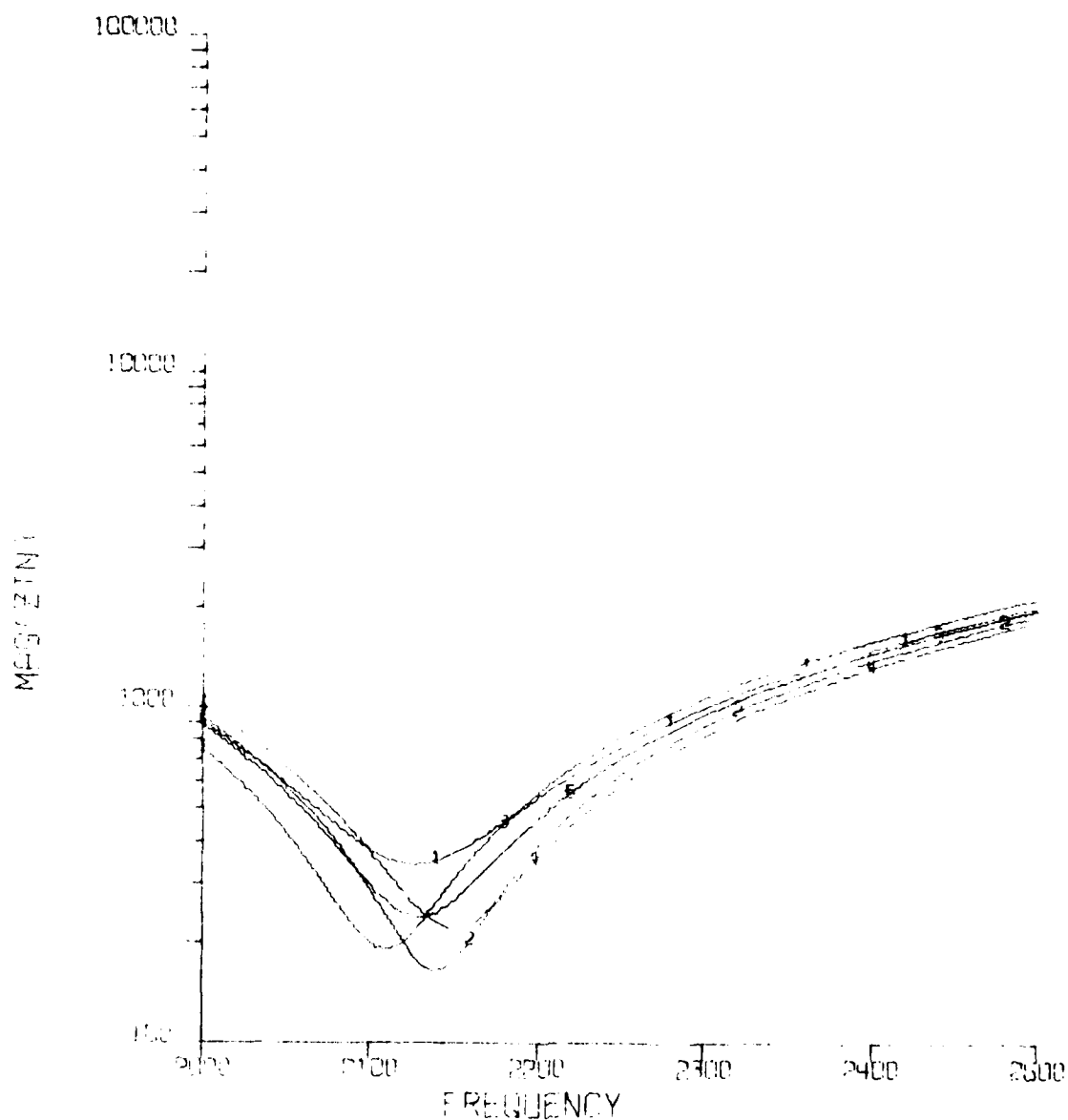
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

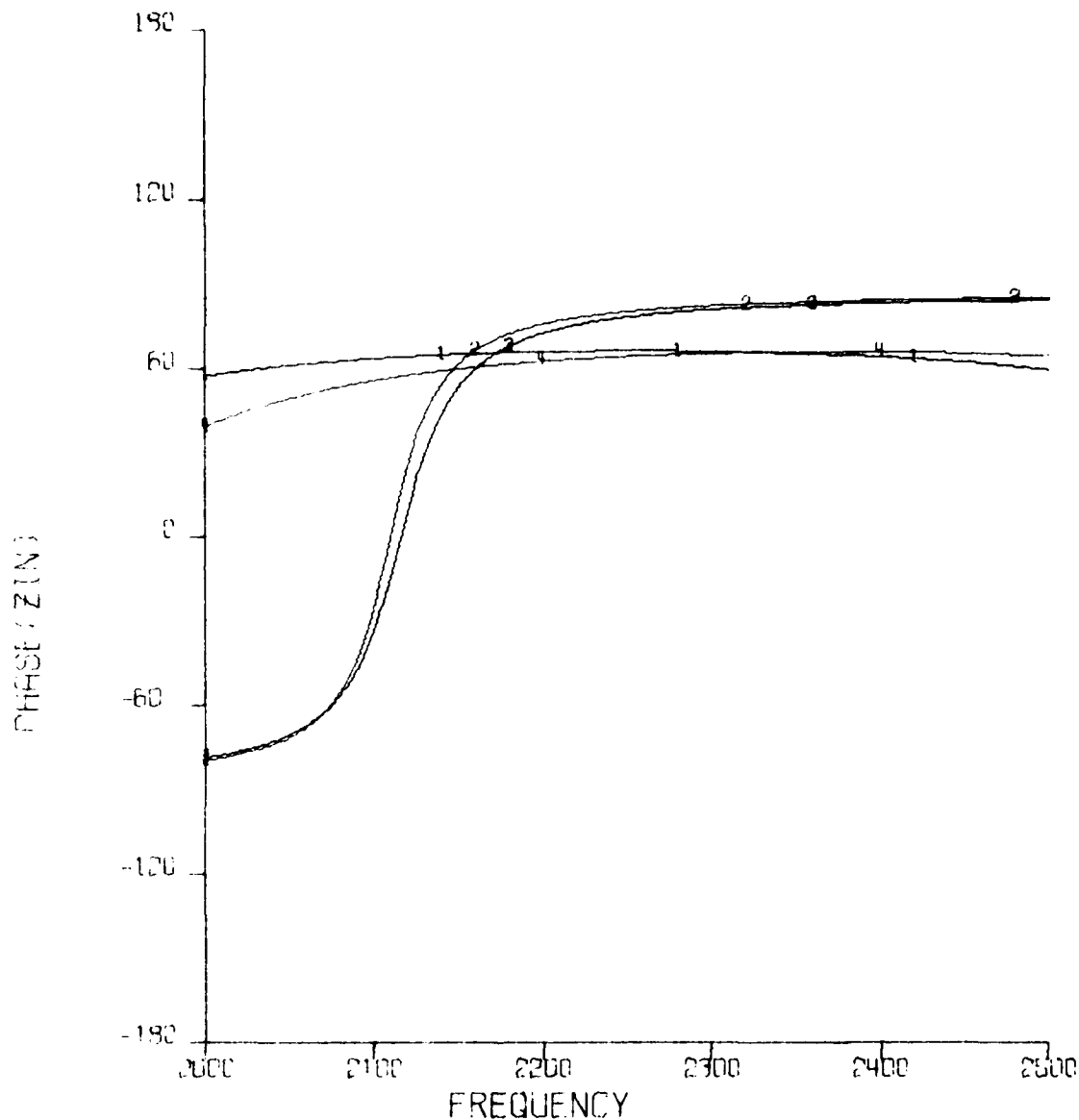
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0,90)
 LS=.1887 GS=E+50 LP=.4483 QP=+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1	= MAX PRES	=8.62318751E03+J3.54954775E03
CURVE 2	= MIN R	=4.04152567E03+J1.58332185E03
CURVE 3	= MAX X	=4.71313038E03+J6.22775241E03
CURVE 4	= MIN X	=5.48191309E03-J1.07796008E02
CURVE 5	= AVG	=5.81087810E03+J3.08428731E03

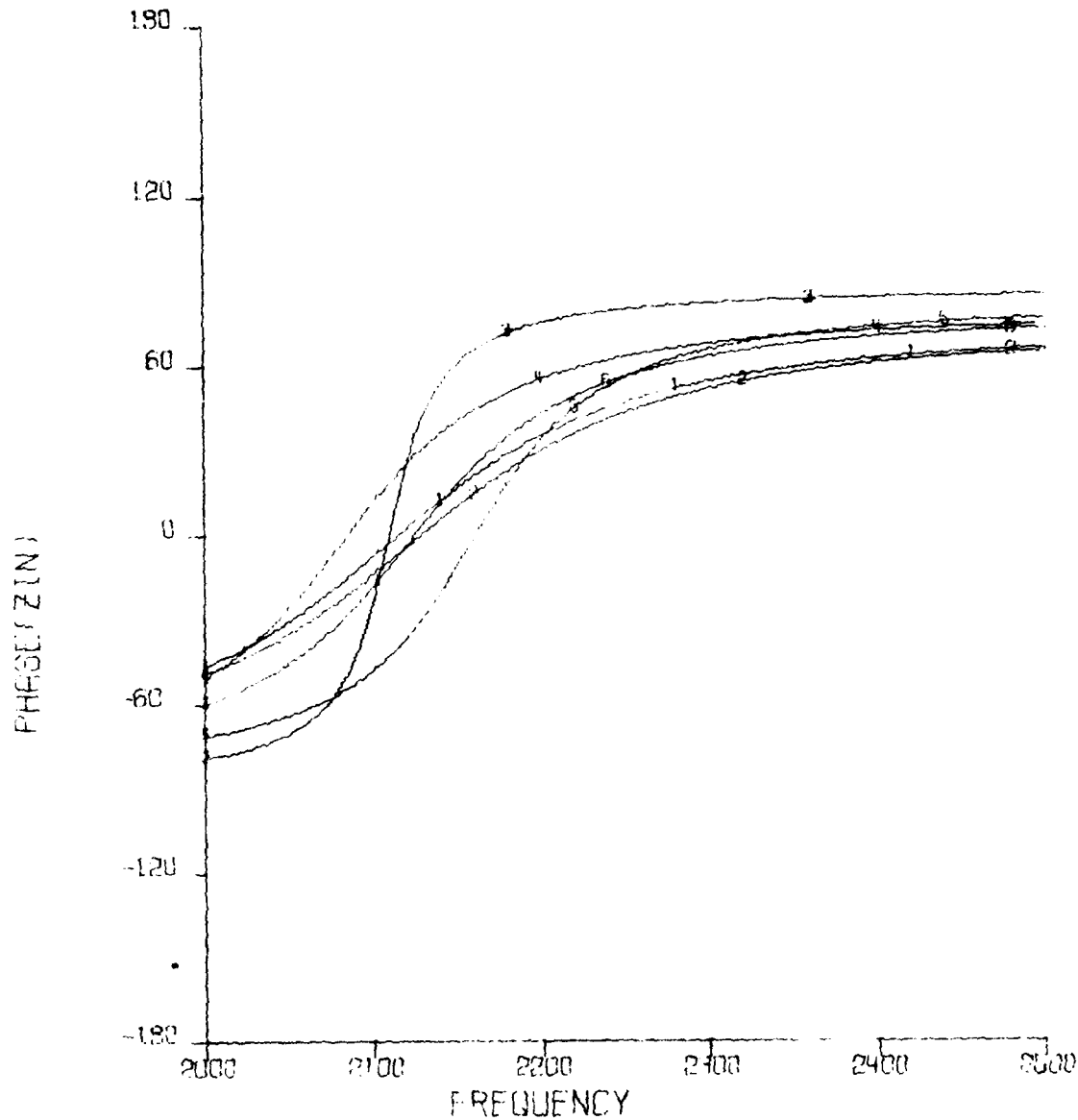
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

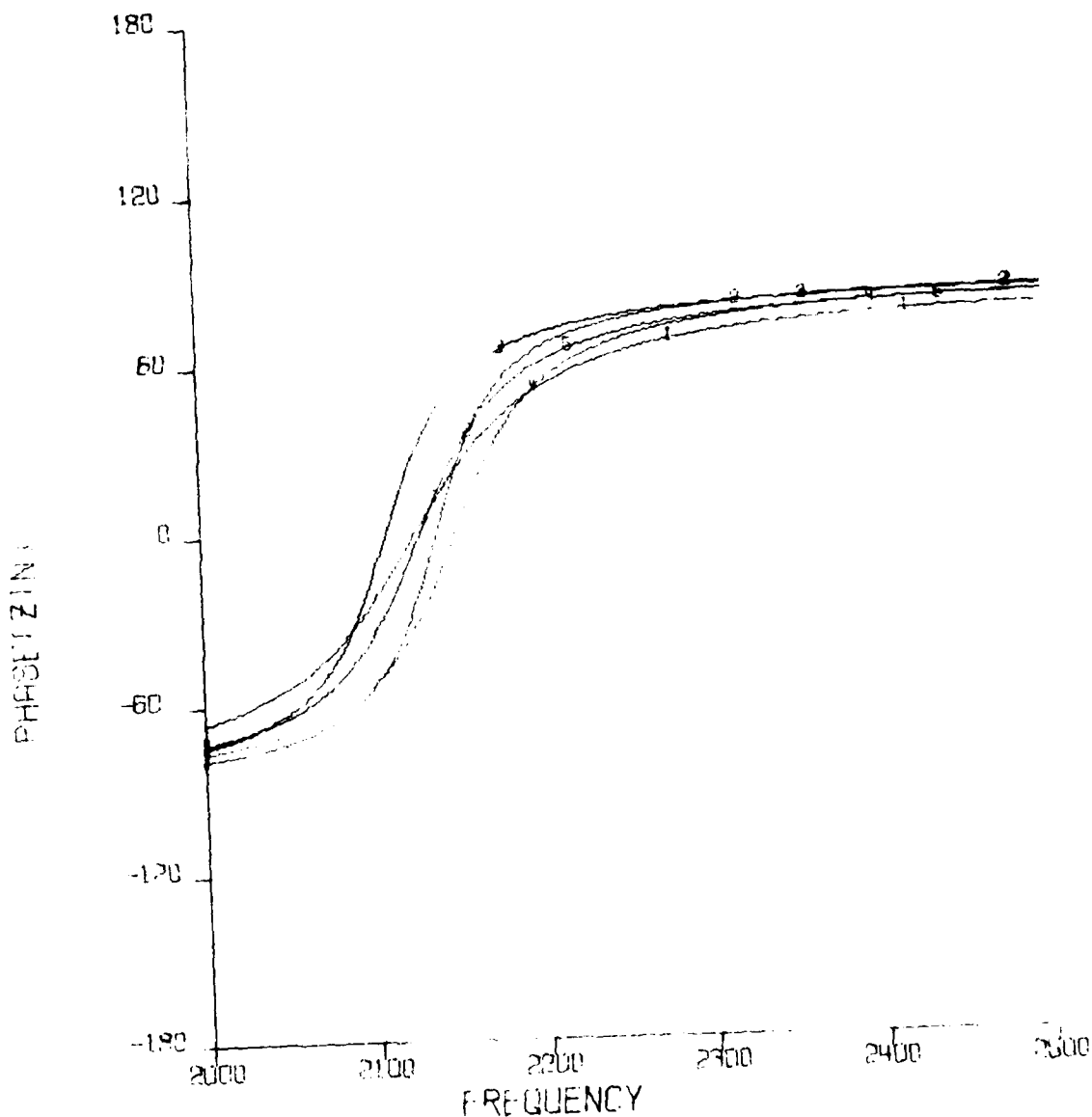
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES	=1.70359401E04+J5.28297277E03
CURVE 2 - MAX R	=1.72759279E04+J3.19188698E03
CURVE 3 - MIN R	=3.18166958E03+J6.18379532E03
CURVE 4 - MAX X	=1.14610701E04+J1.00632375E04
CURVE 5 - MIN X	=8.09602396E03-J1.58026307E03
CURVE 6 - AVG	=1.14146594E04+J3.81251049E03

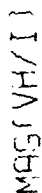
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

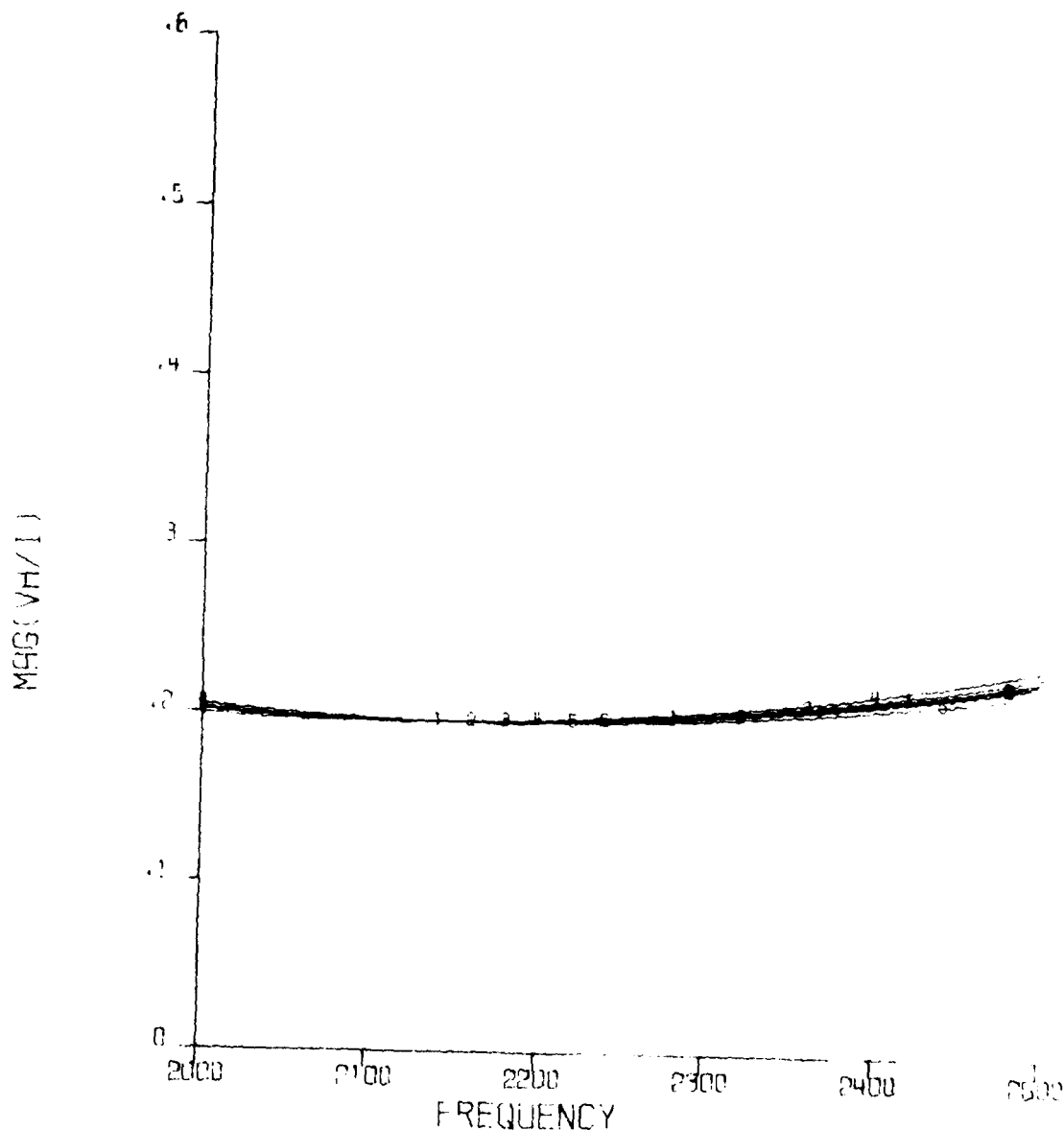
LS = .1887 OS = E + 50 LF = .4483 GP = +50



MEASURING VERBAL FREQUENCY

CURVE 1	MAX FRE	3.0000000000000000E+01	3.4333400000000000E+01
CURVE 2	MIN R	1.0000000000000000E+00	1.5221000000000000E+00
CURVE 3	MIN X	0.0000000000000000E+00	1.9126000000000000E+00
CURVE 4	GV	0.0000000000000000E+00	4.3321000000000000E+00

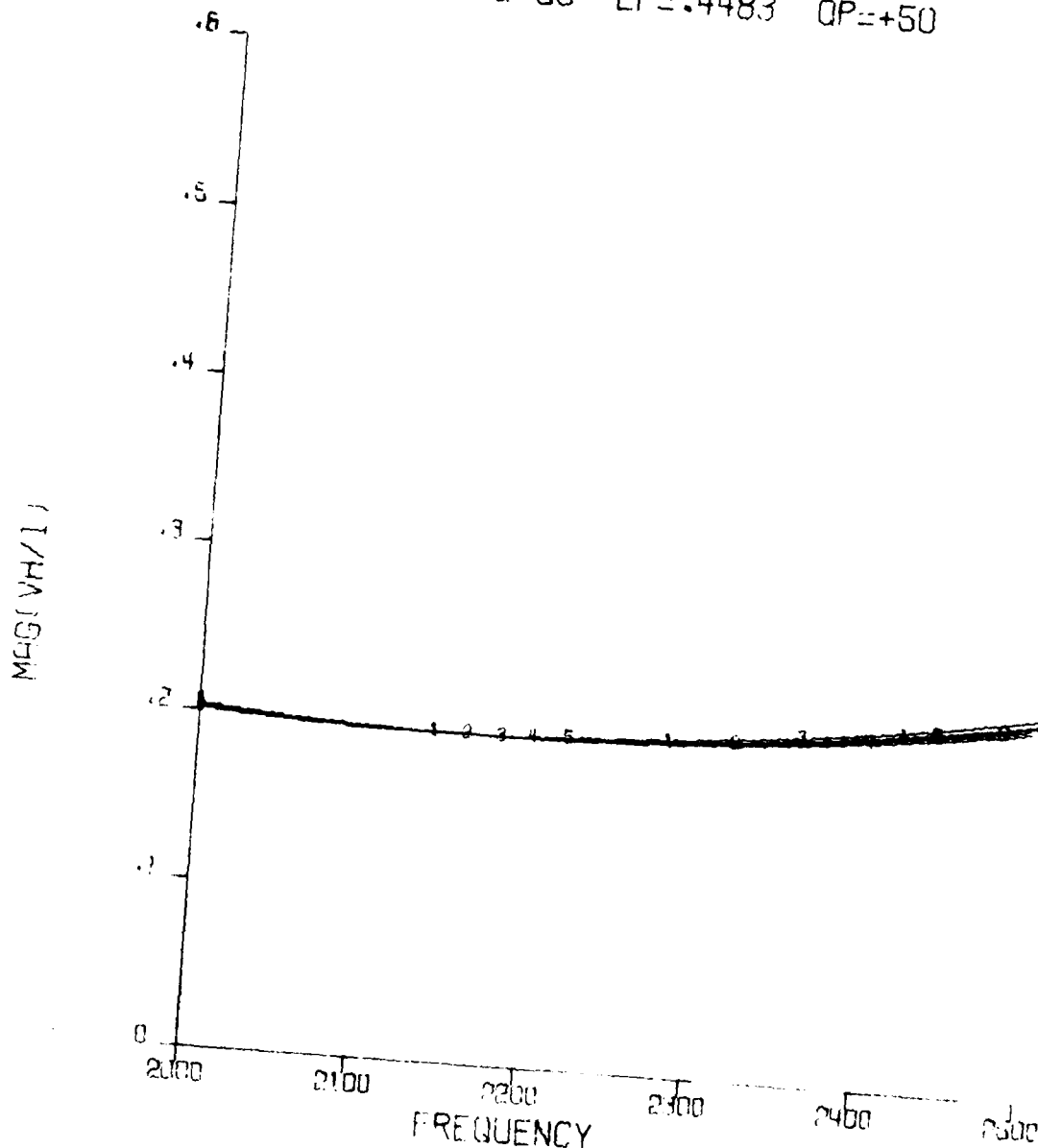
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1887 OS=E+50 LP=.4483 QP=+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188899E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375531E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

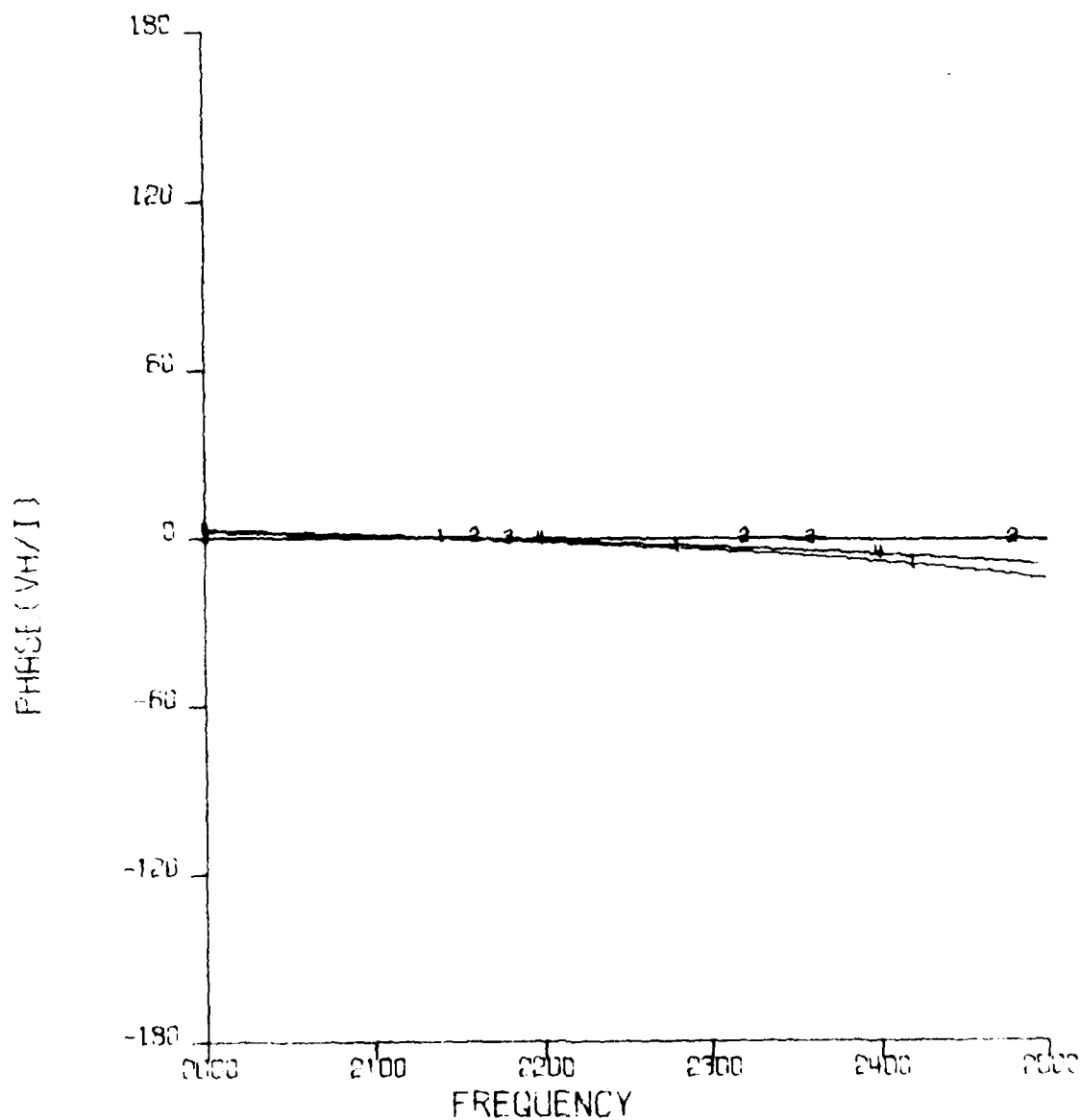
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1887 OS=E+50 LP=.4483 OP=+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

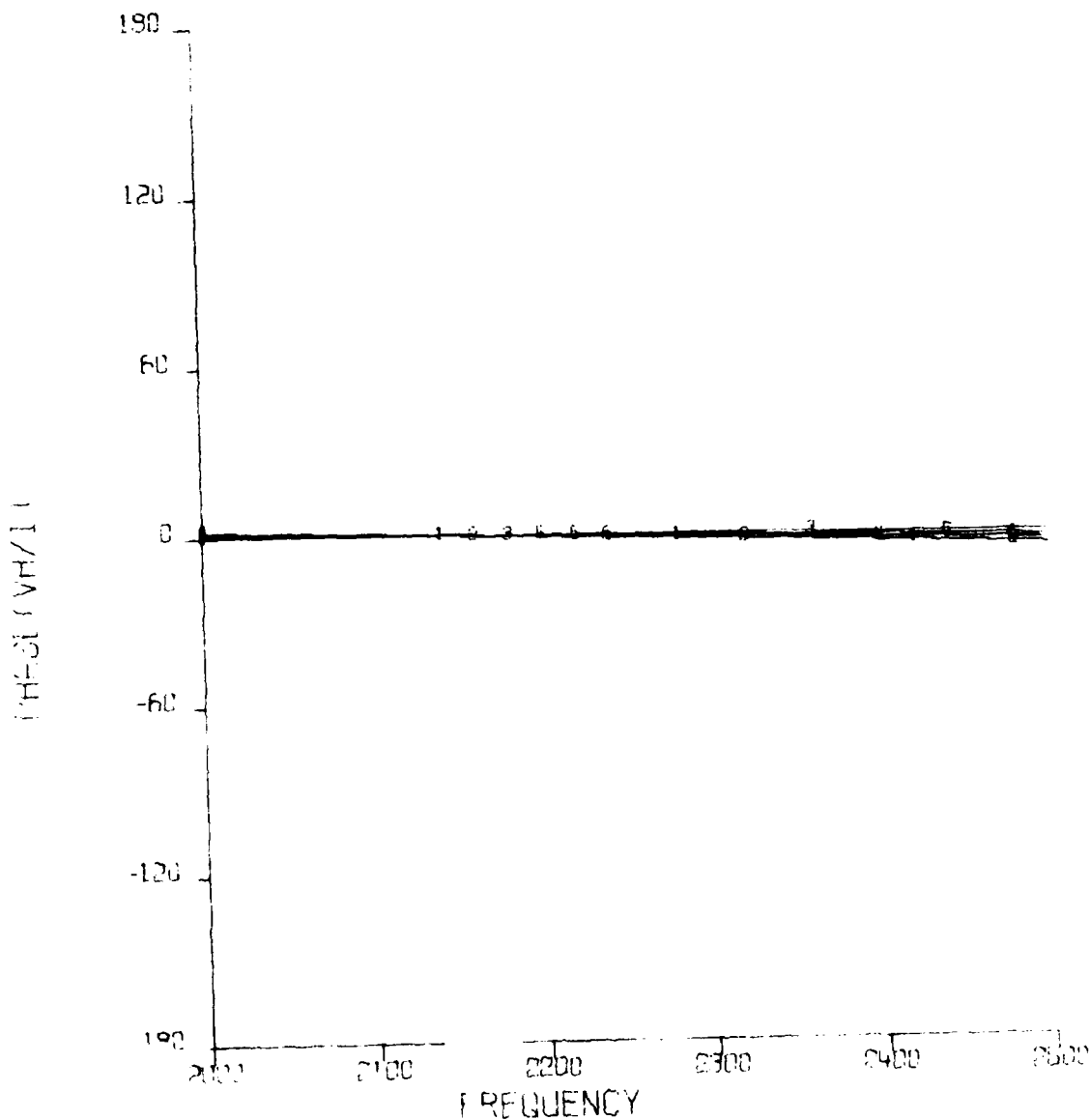
TRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205728E04+J4.33216347E04

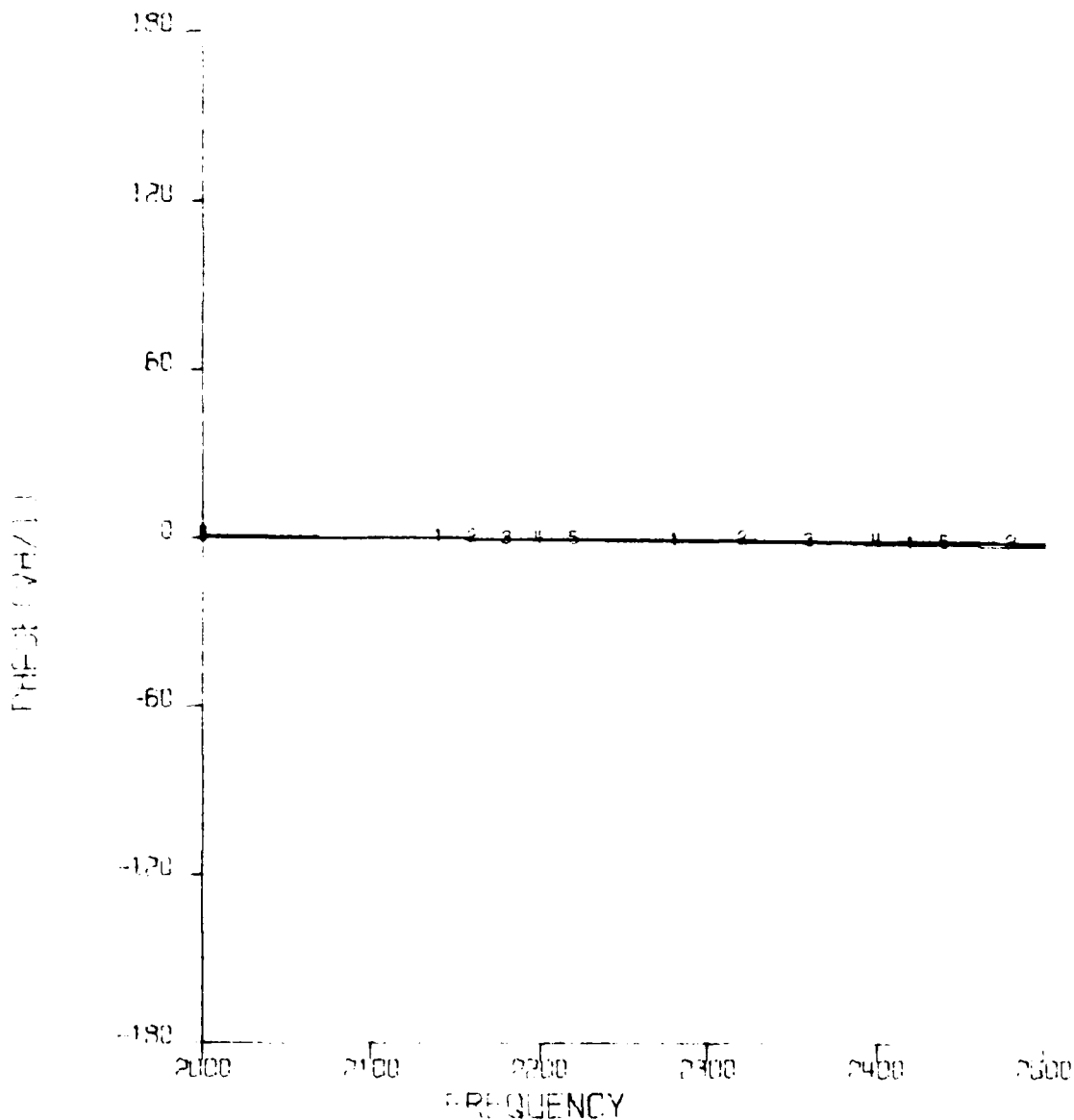
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1887 QS=E+50 LP=.4483 OP=+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R -1.72759279E04+J3.19185698E03
 CURVE 3 - MIN R -3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X -1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X -9.0960299E03-J1.58026357E03
 CURVE 6 - AVG -1.14146099E04+J3.21251049E03

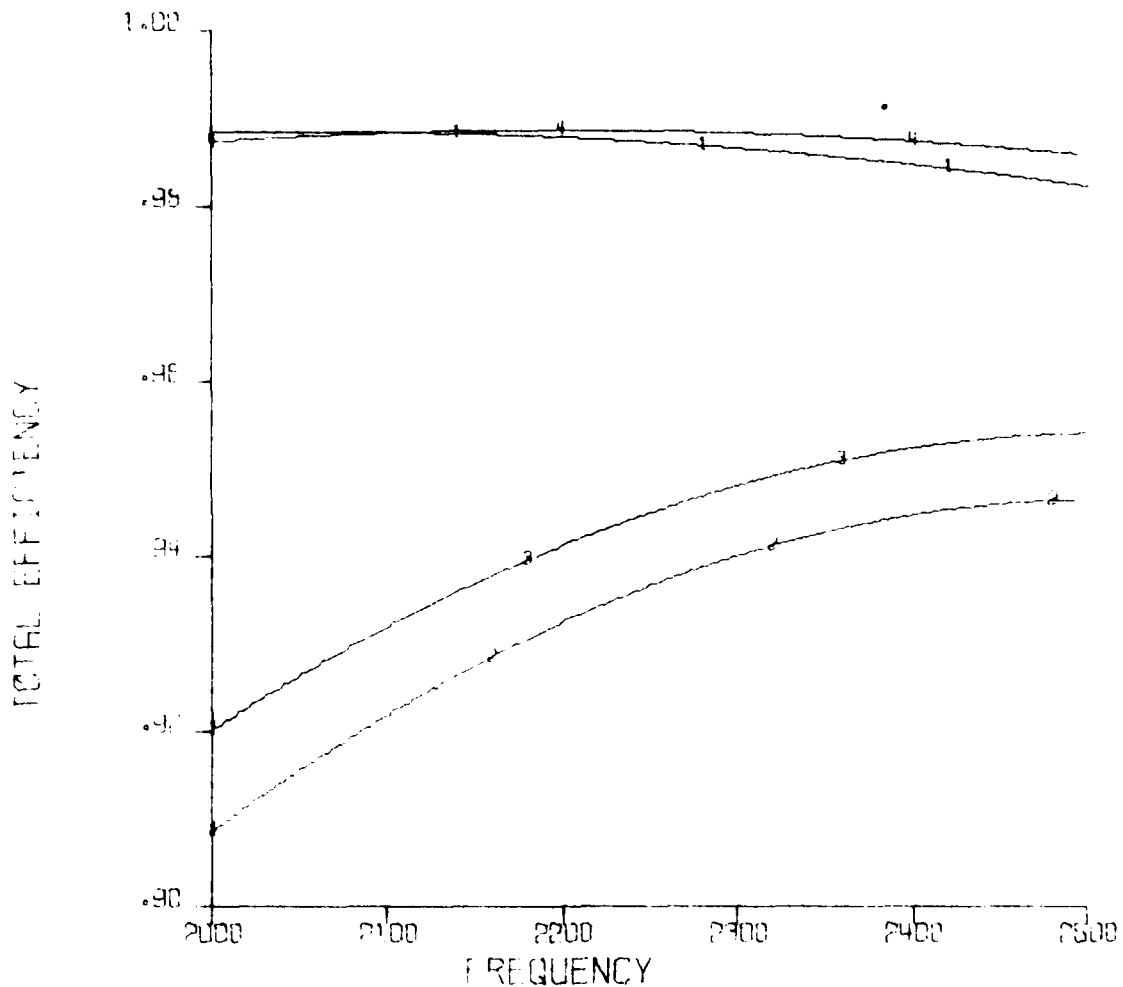
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1887 OS=E+50 LP=.4483 QP=+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRS = $8.62318751E03 + J3.54954775E03$
 CURVE 2 - MIN R = $-4.70415256E03 + J1.58332185E03$
 CURVE 3 - MAX X = $-4.71313038E03 + J6.22775241E03$
 CURVE 4 - MIN X = $-5.48191309E03 - J1.07396008E03$
 CURVE 5 - AVG = $-5.92082810E03 + J3.10842873E03$

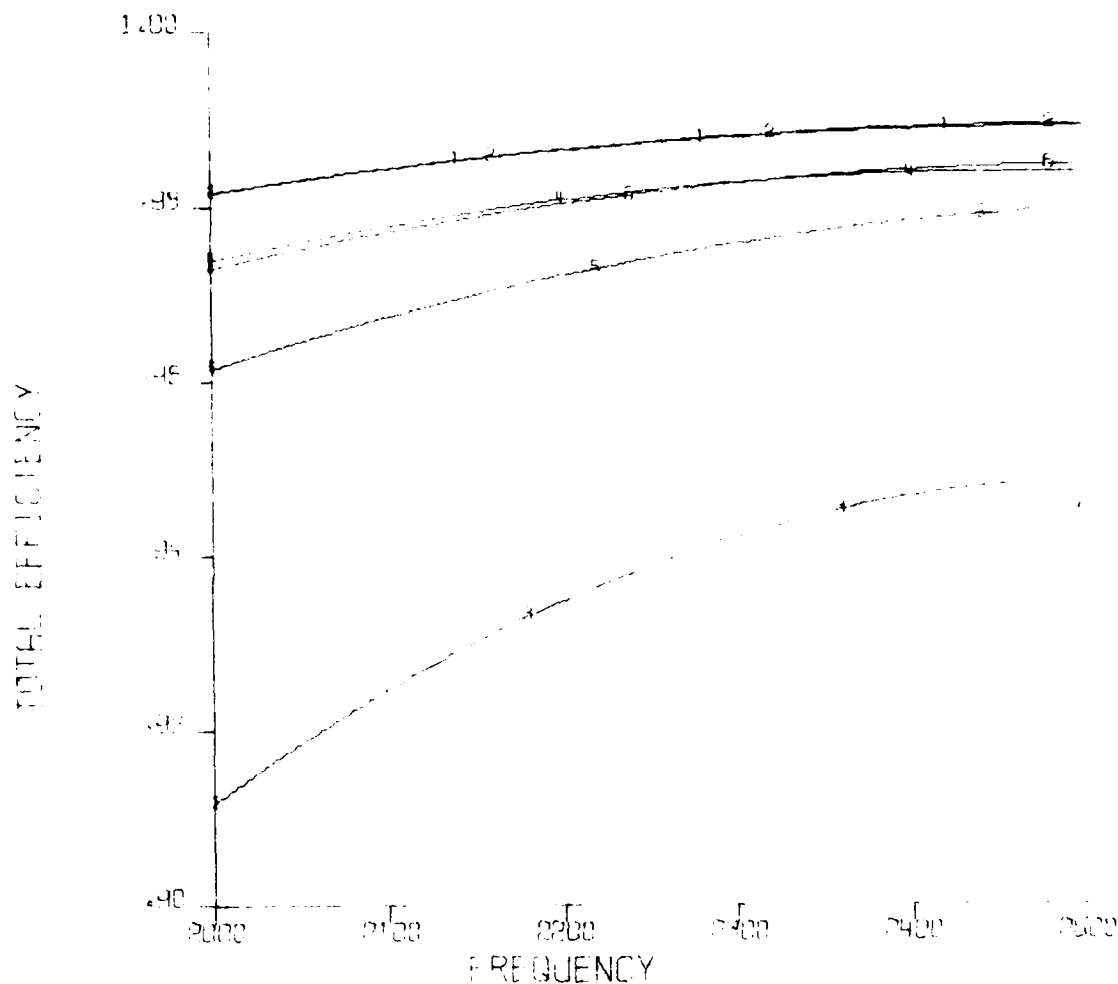
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=F+50 LP=.4483 QP=+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX $PRE = 3.09590054E04 + J6.84589403E04$
 CURVE 2 - MIN R $= 3.06295370E03 + J6.15220309E03$
 CURVE 3 - MIN X $= 3.57300970E03 + J5.19126037E03$
 CURVE 4 - AVG $= 2.44205720E04 + J4.33216357E04$

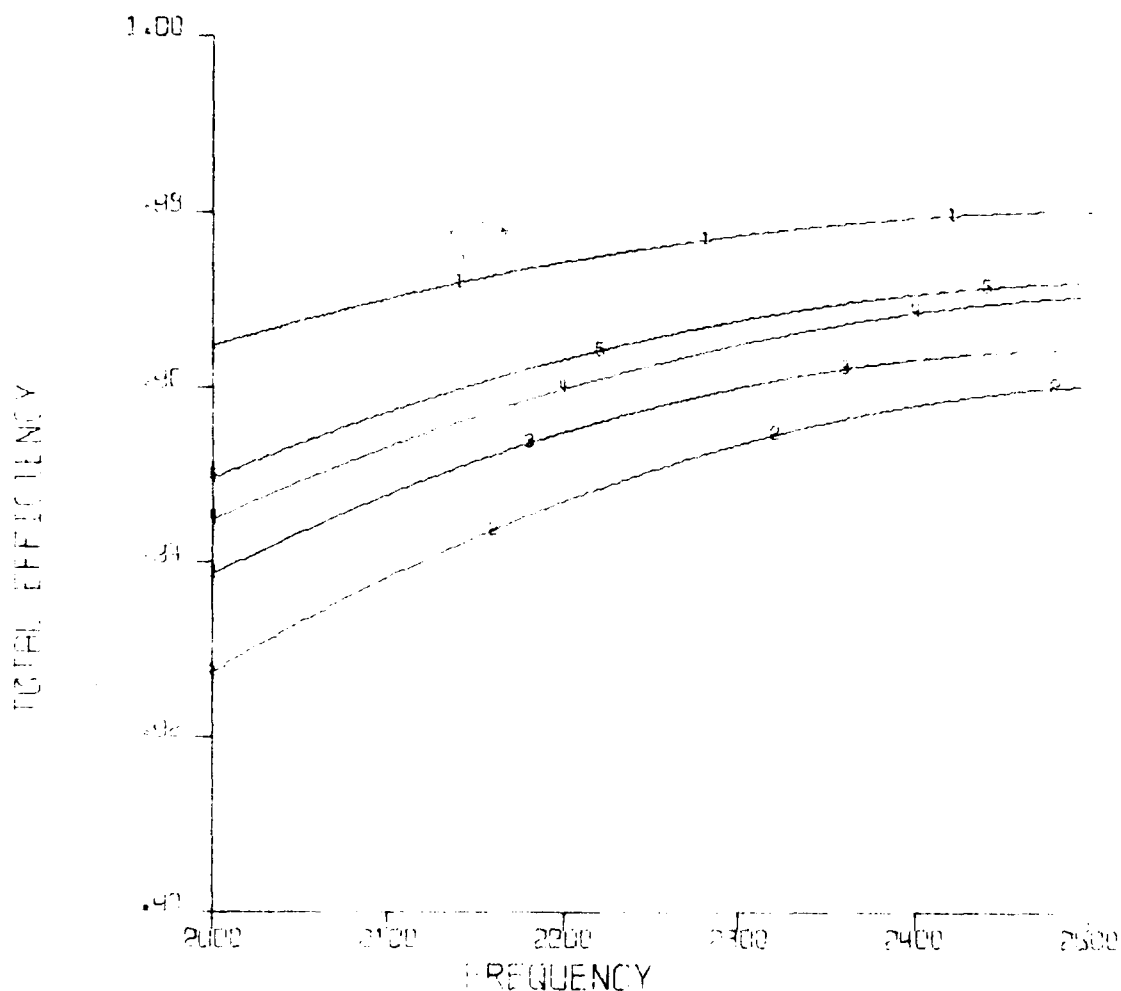
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1887 OS=E+50 LP=.4483 OP=+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.7820177E03
 CURVE 2 - MAX R =1.72789479E04+J3.19188595E02
 CURVE 3 - MIN P =3.18166958E02+J6.18375630E03
 CURVE 4 - MAX X =1.14610751E04+J1.00631235E04
 CURVE 5 - MIN X =8.09607396E03+J1.58026313E03
 CURVE 6 - AVC =1.14146509E04+J3.81251349E03

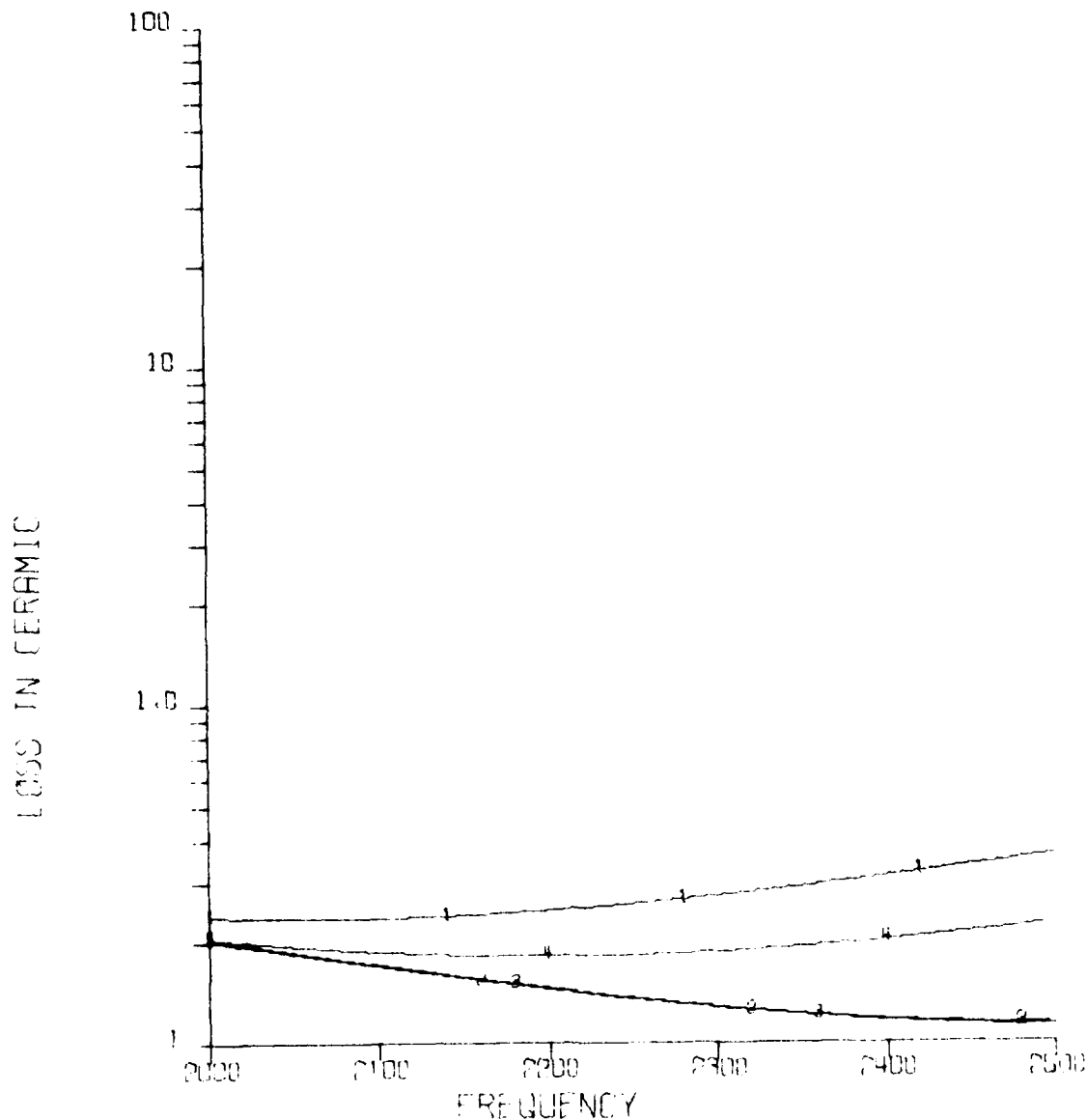
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0,90)
 LS=.1887 GS=E+50 LP=.4483 QP=+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954773E03
 CURVE 2 - MIN R =4.04152567E03+J1.5833.185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22770241E03
 CURVE 4 - MIN X =5.48191309E03+J1.07786008E03
 CURVE 5 - P/E =5.82082810E03+J3.08428731E03

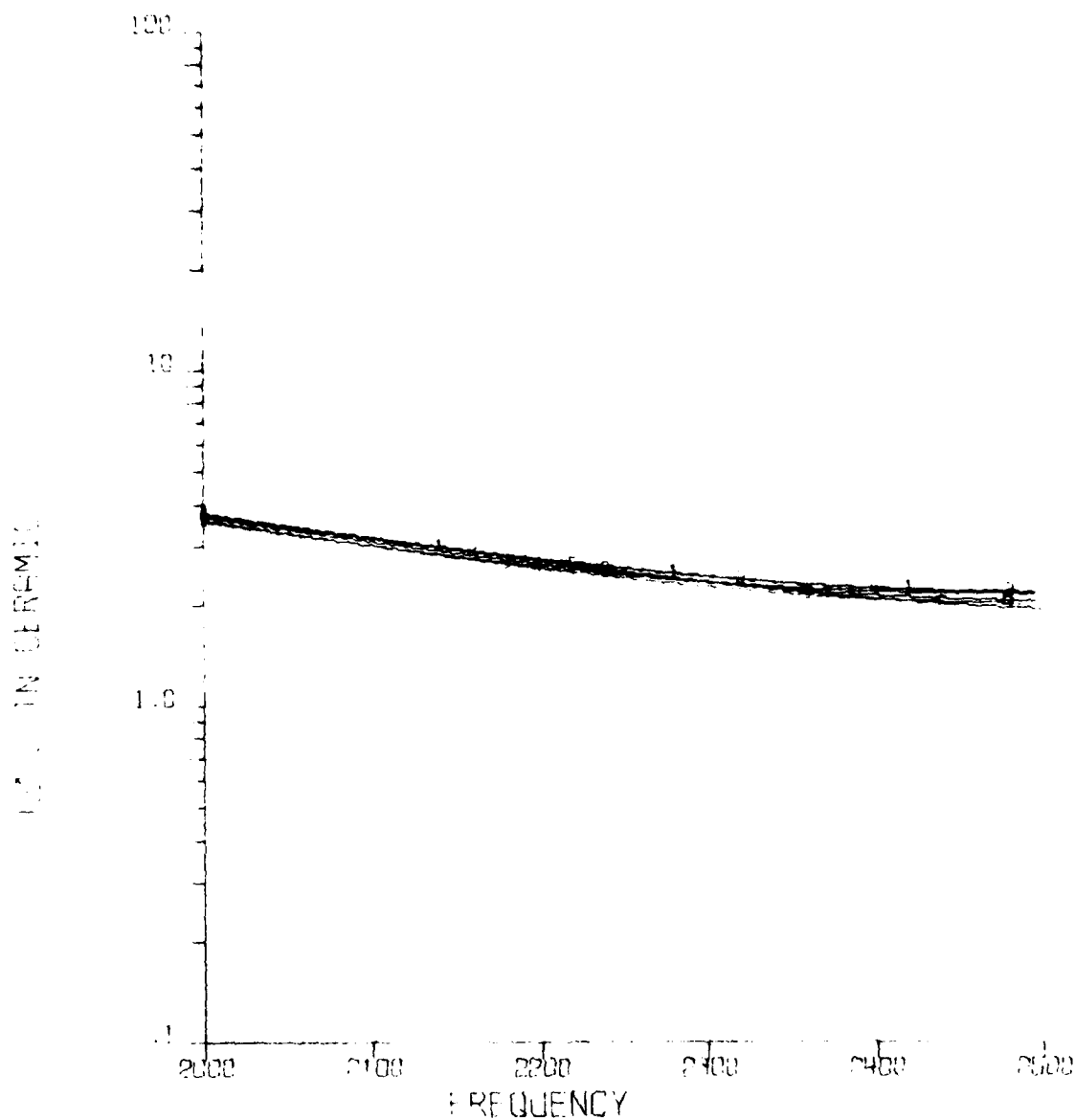
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589407E04
 CURVE 2 - MIN R =3.06205372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVC =2.44205725E04+J4.33216357E04

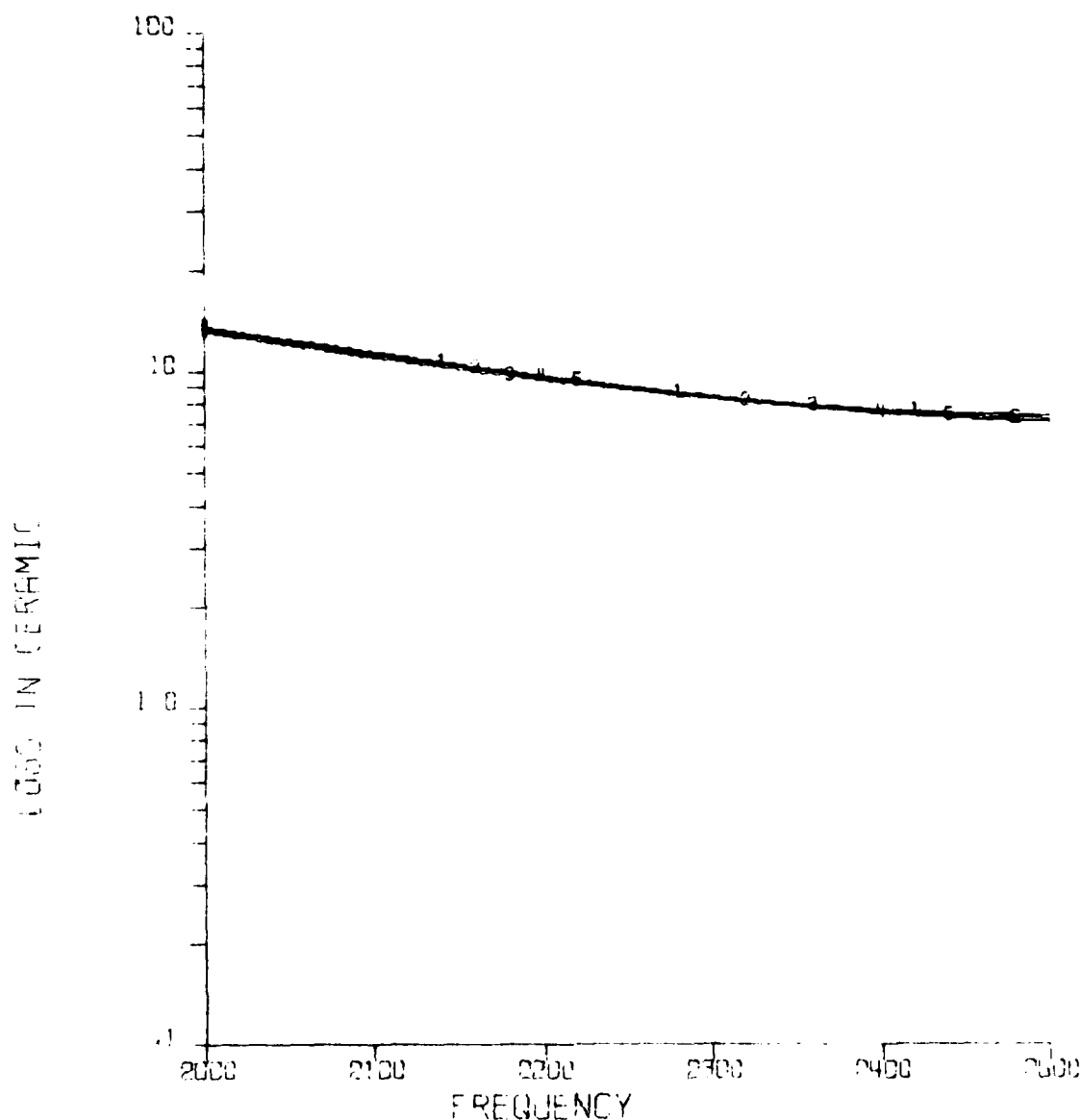
TRD DUMIL OAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1887 OS=E+50 LP=.4483 OP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.19166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09607998E03+J1.58076457E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

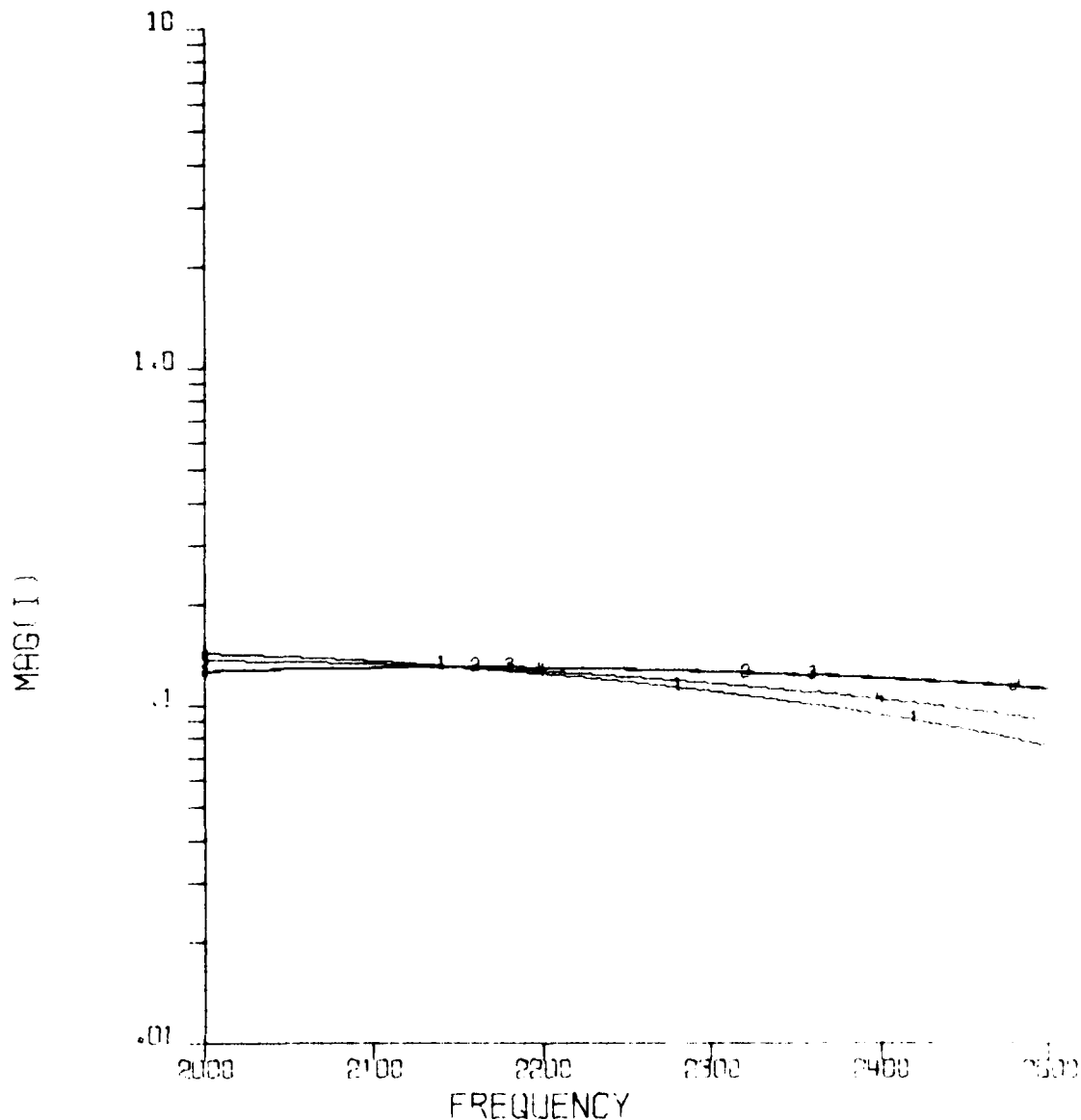
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1887 OS=E+50 LP=.4483 QP=+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03+J1.07796008E03
 CURVE 5 - AVG =5.92087810E03+J3.08428731E03

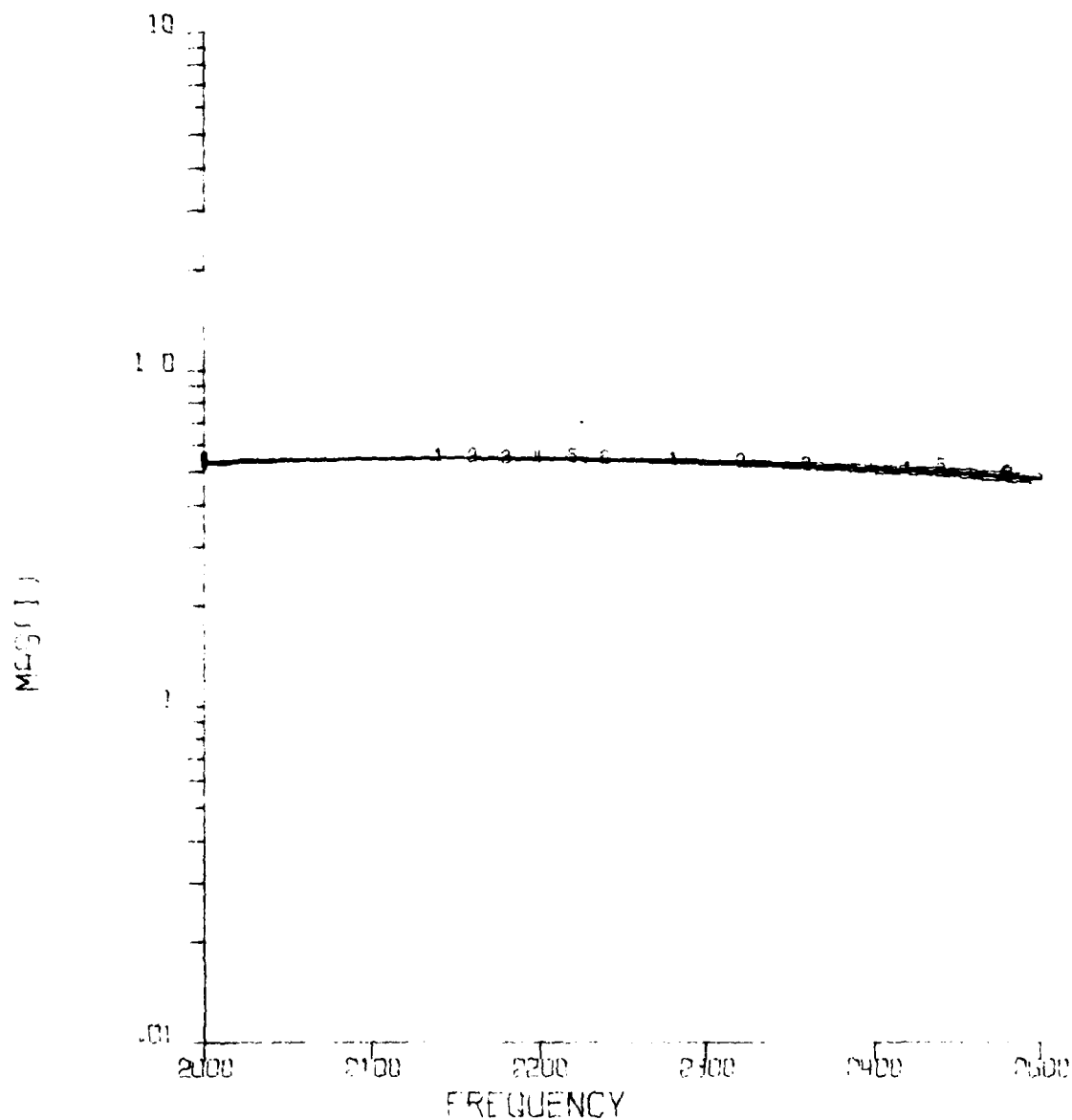
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

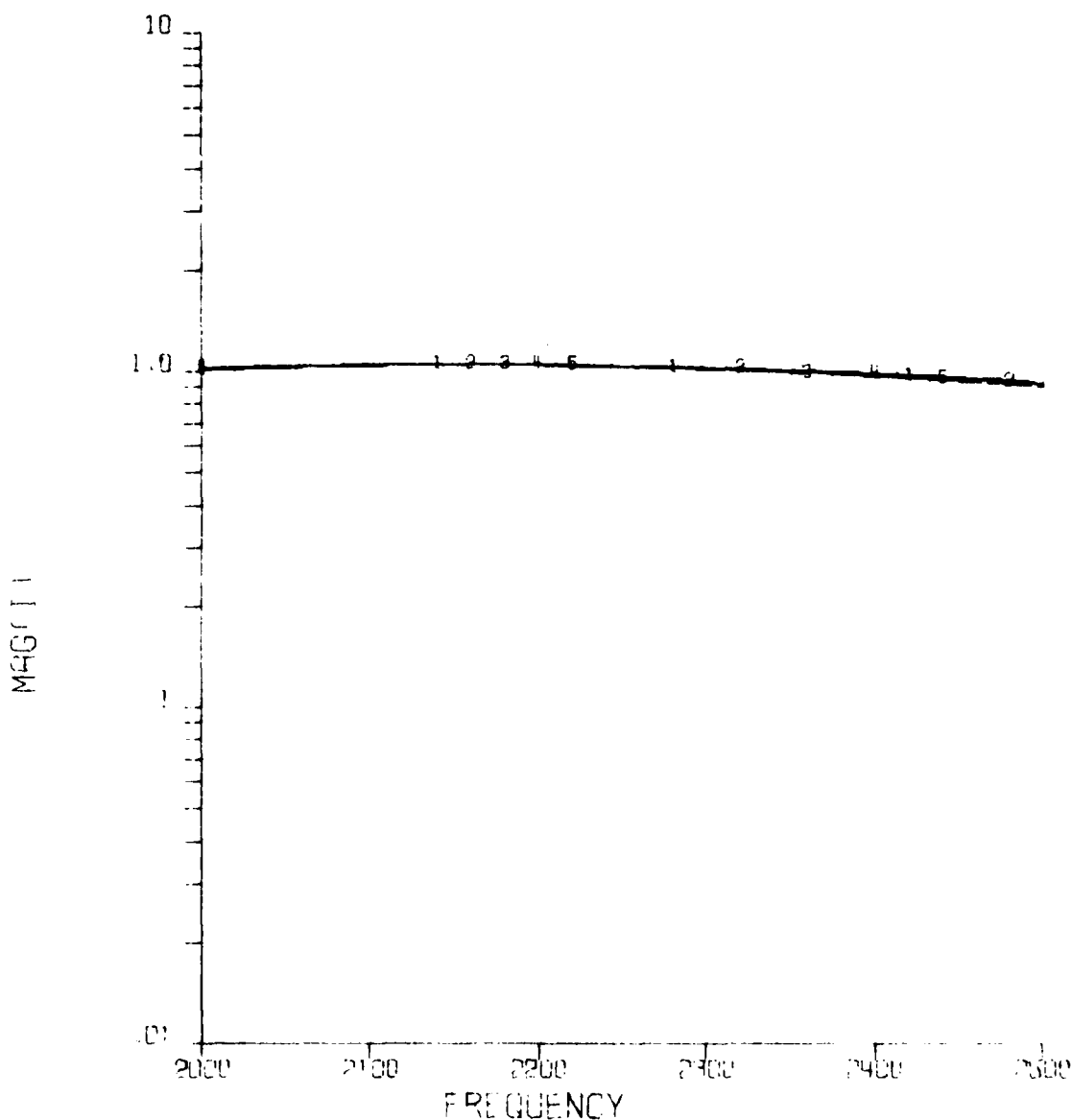
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1887 OS=E+50 LP=.4483 OP=+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18370537E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632373E04
 CURVE 5 - MIN X =8.09602896E03-J1.58076357E03
 CURVE 6 - AVG =1.14146599E04+J3.81701049E03

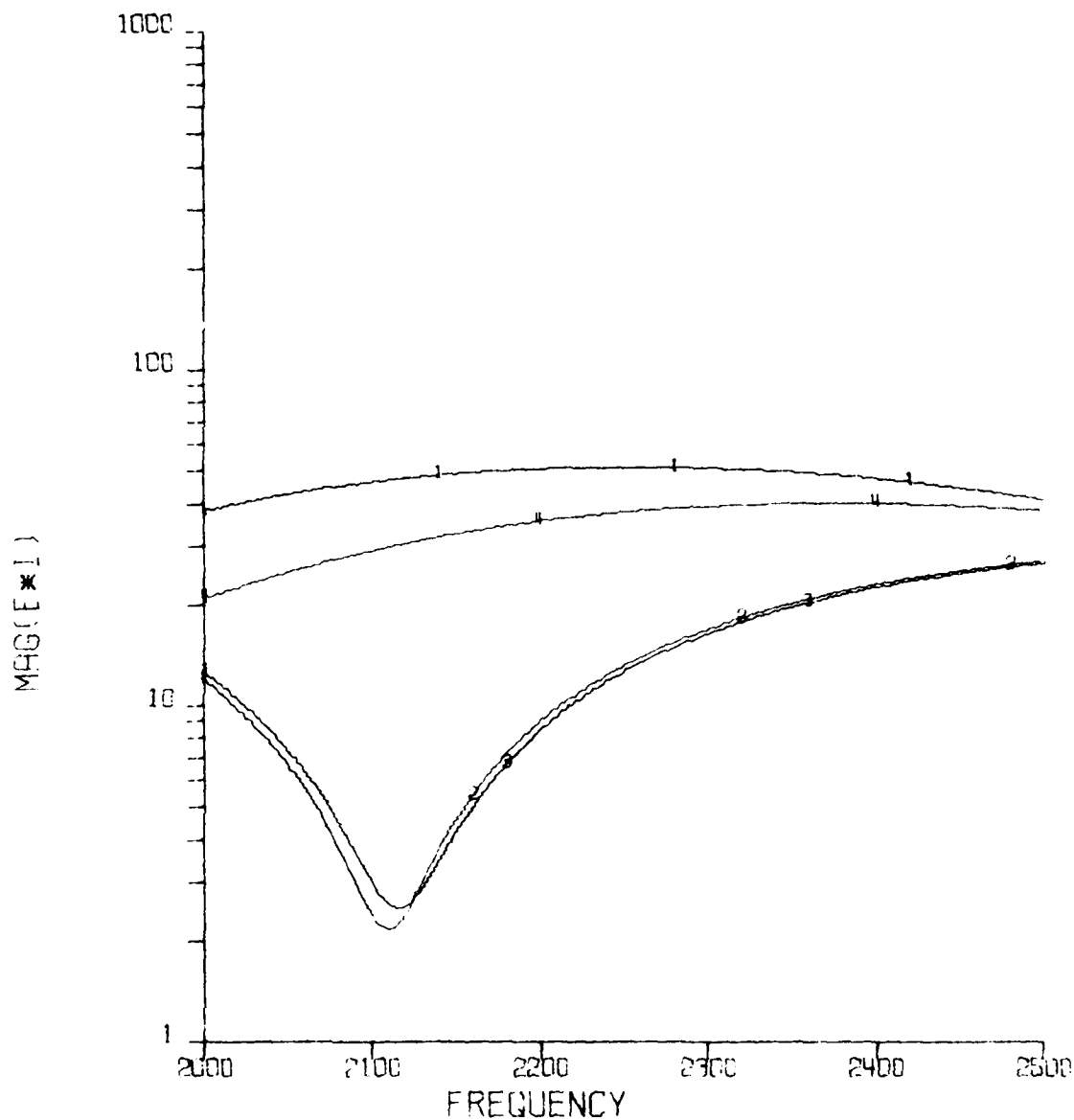
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0,90)
 LS=.1887 GS=E+50 LP=.4483 QP=+50



MAG11 VERSUS FREQUENCY

CURVE 1 - MAX PRS= $8.62318751E03+J3.54954775E03$
 CURVE 2 - MIN R = $4.04152567E03+J1.58332185E03$
 CURVE 3 - MAX X = $4.71313035E03+J6.22775241E03$
 CURVE 4 - MIN X = $5.49191309E03+J1.67796008E02$
 CURVE 5 - AVG = $5.97080810E03+J3.08428731E03$

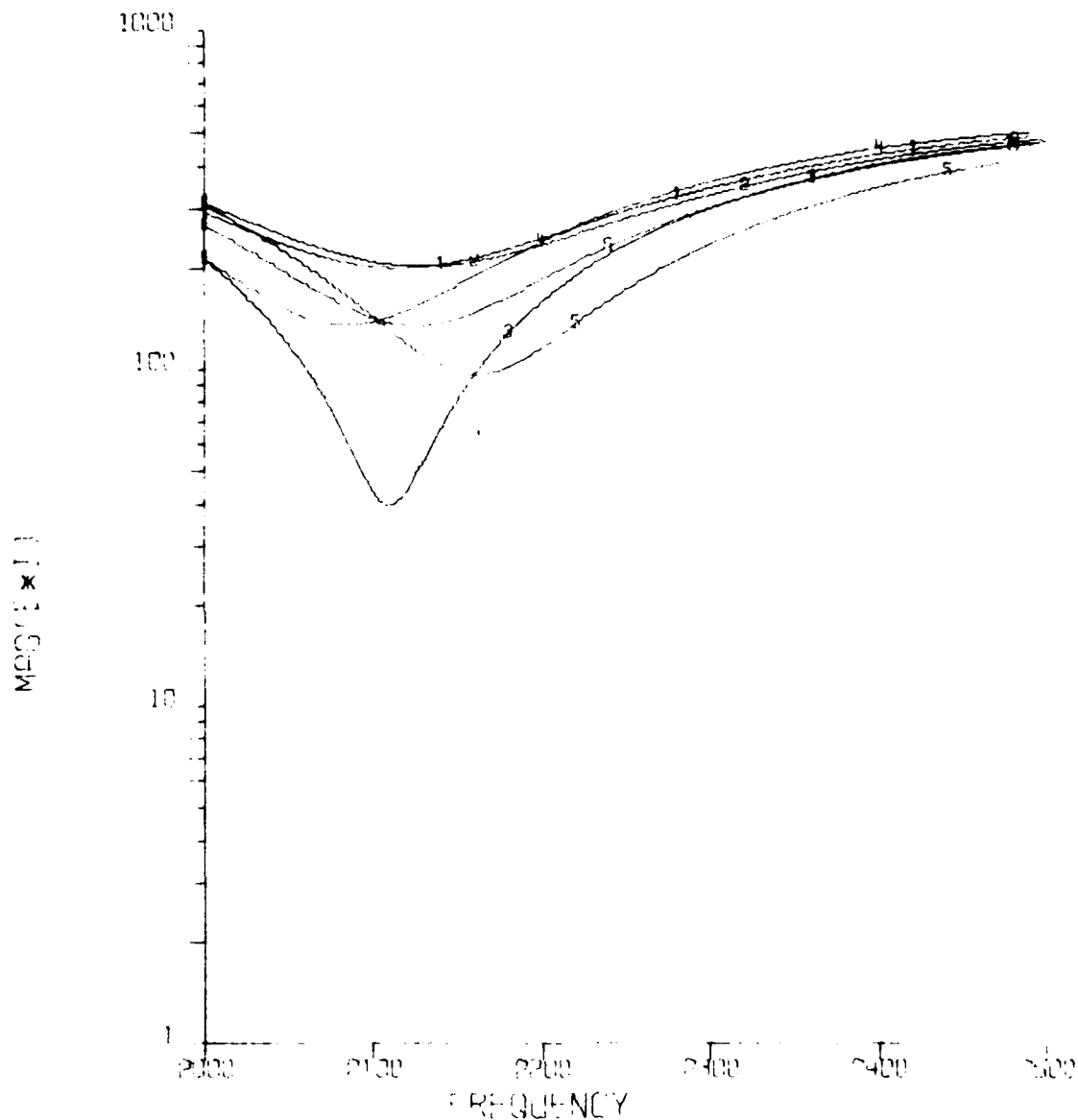
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216397E04

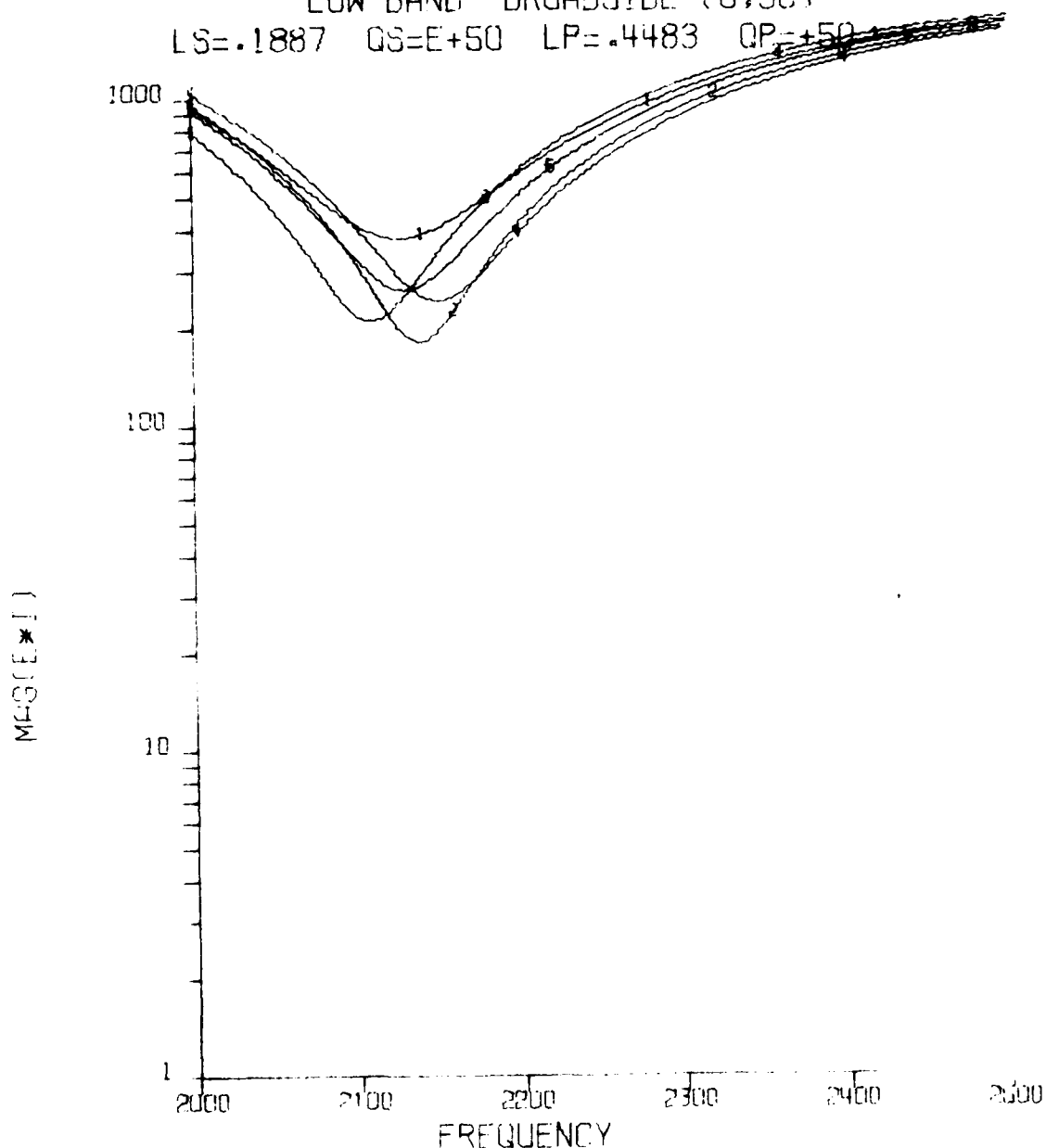
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1897 QS=E+50 LP=.4483 QP=+50



MAG (x1) VERSUS FREQUENCY

CURVE 1 - MAX	$P = 1.70359401E04 + J5.2820777E03$
CURVE 2 - MAX R	$-1.72759427E04 + J3.1918889E03$
CURVE 3 - MIN R	$1.18166958E03 + J6.1837553E03$
CURVE 4 - MAX X	$-1.14610751E04 + J1.0063737E04$
CURVE 5 - MIN X	$-8.0460298E02 + J1.6807671E03$
CURVE 6 - AVG	$-1.1414659E04 + J3.2125104E03$

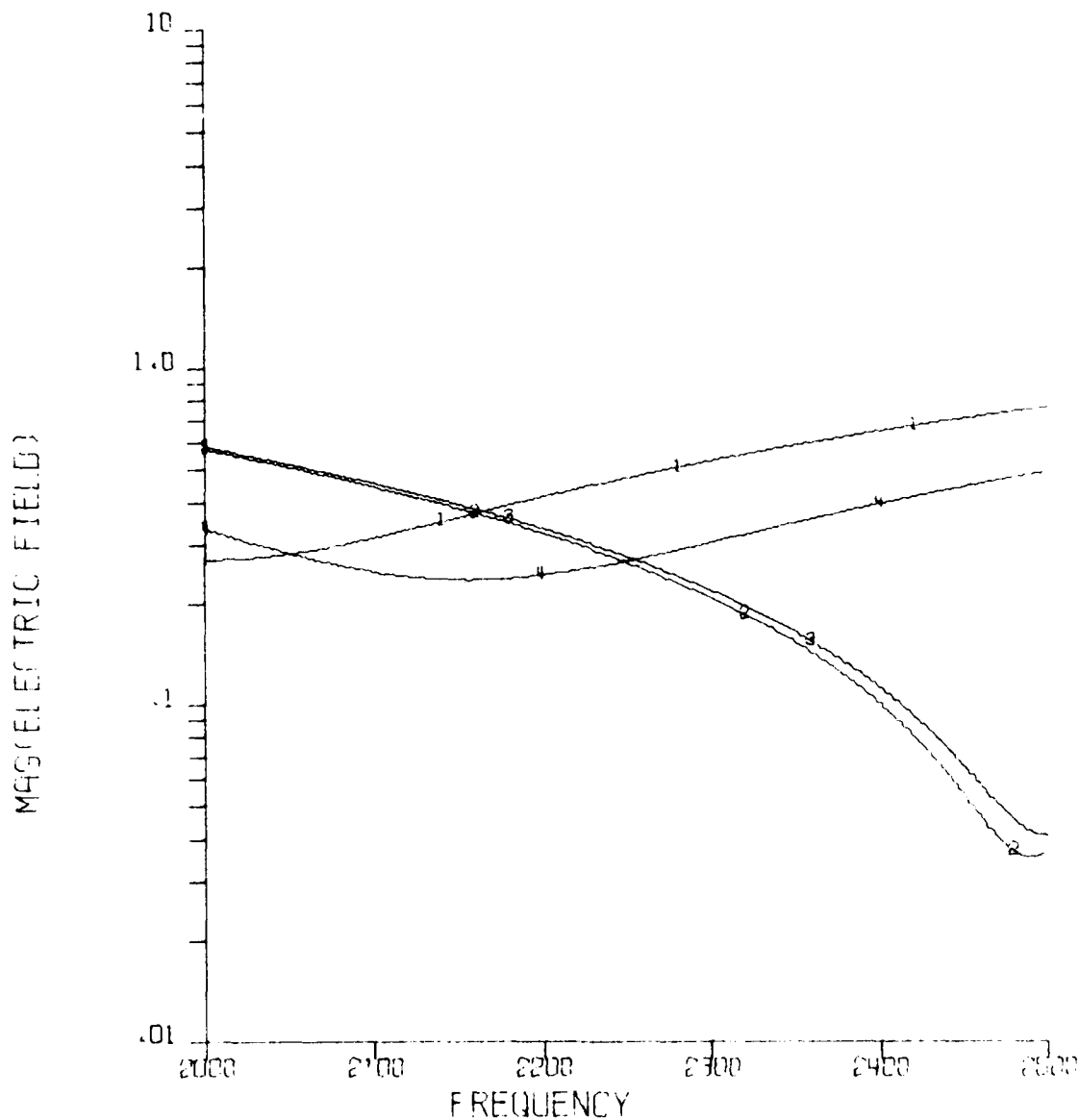
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.64964770E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07786008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428711E02

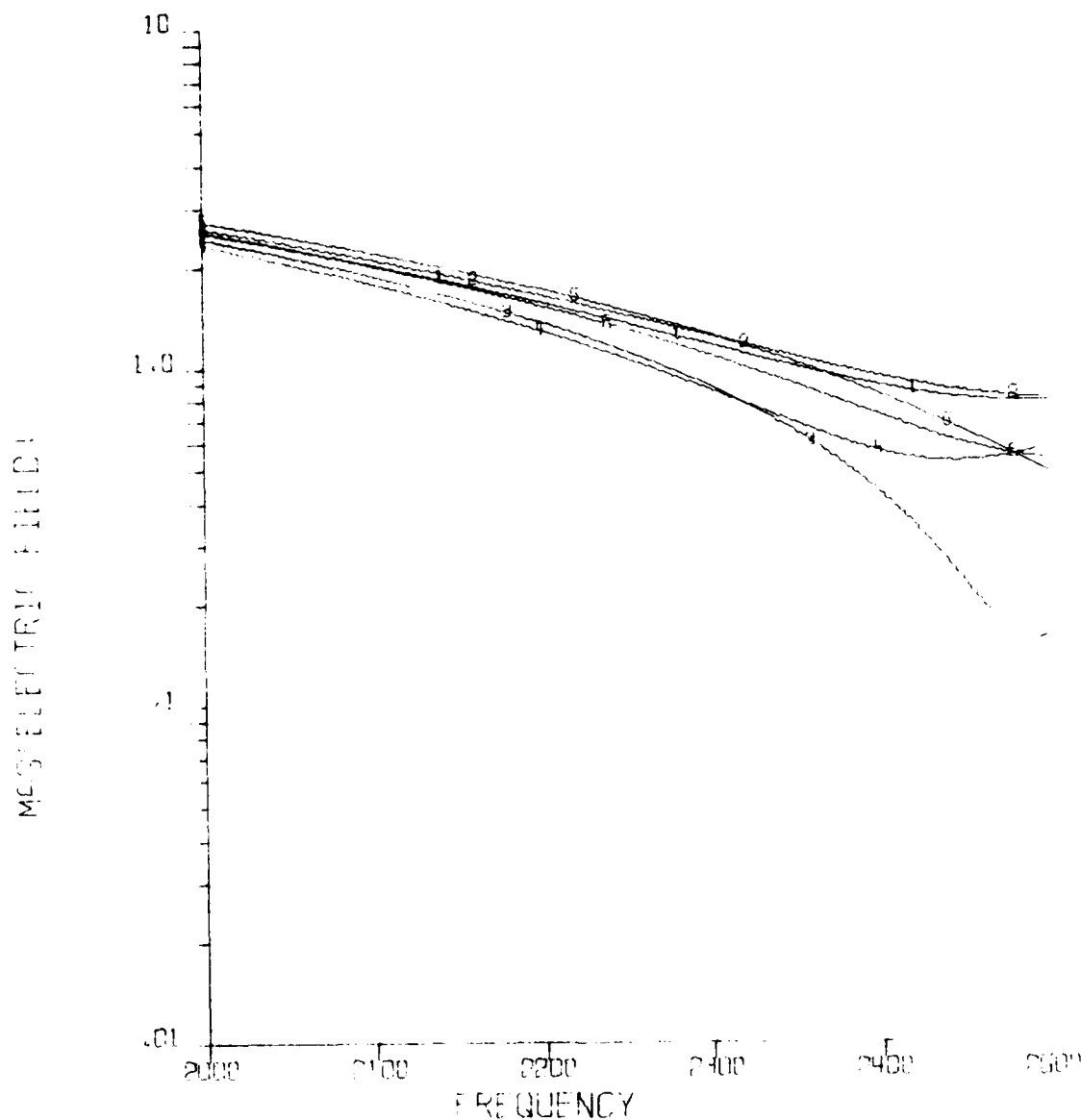
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0.0)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589400E04
 CURVE 2 - MIN R =3.06294372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =3.44209728E04+J4.33216357E04

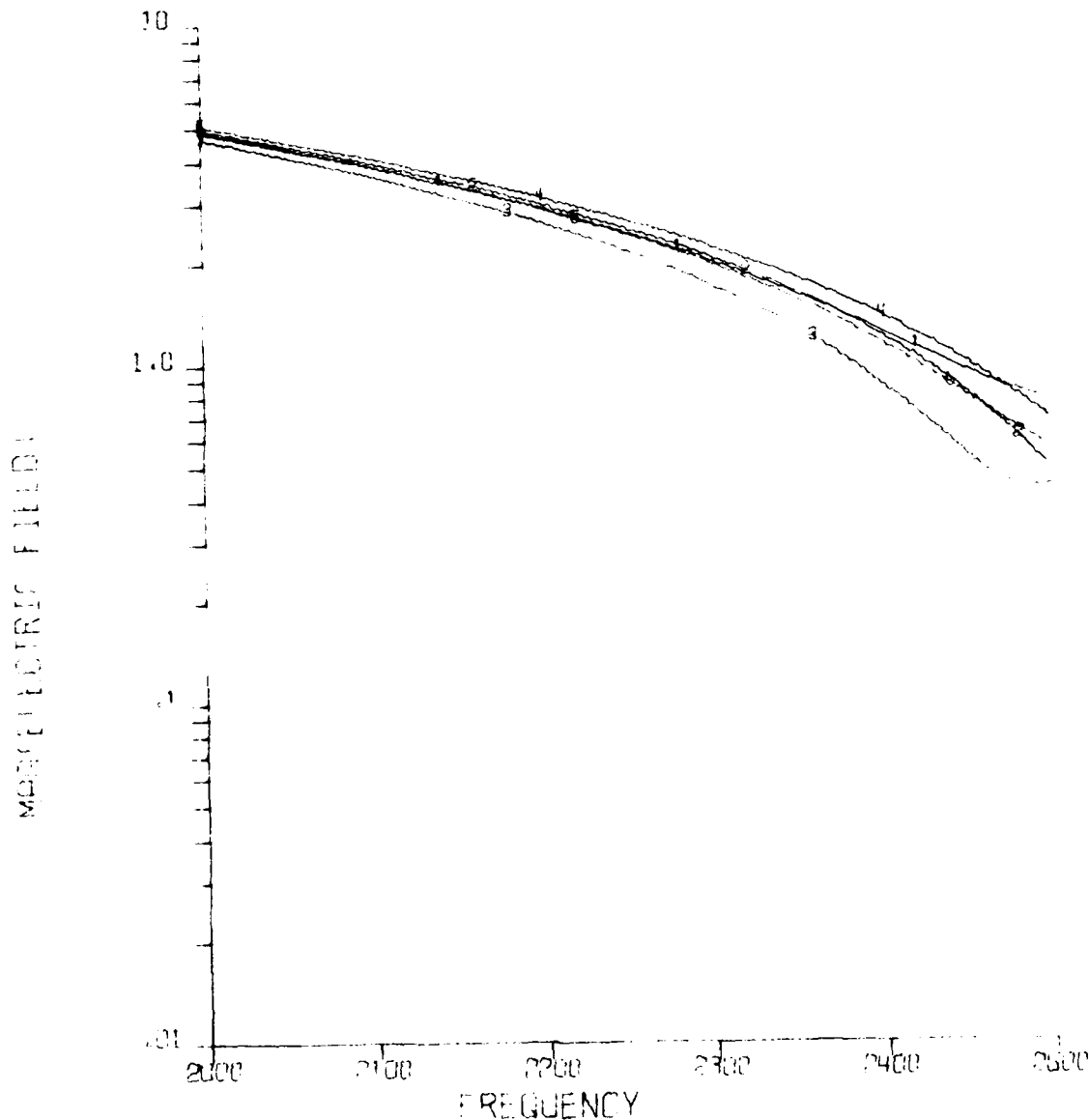
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1887 OS=F+50 LP=.4483 OP=+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRE = $1.70359401E04 + J5.28297777E02$
 CURVE 2 - MAX R = $1.72759174E04 + J3.19188895E02$
 CURVE 3 - MIN R = $3.18166958E03 + J6.19375532E02$
 CURVE 4 - MAX X = $1.14610751E04 + J1.00632375E04$
 CURVE 5 - MIN X = $8.09602146E03 + J1.58026357E02$
 CURVE 6 - AVG = $1.14146509E04 + J3.81251049E02$

TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0,90)
 LS=.1887 QS=E+50 LP=.4483 QP=+50



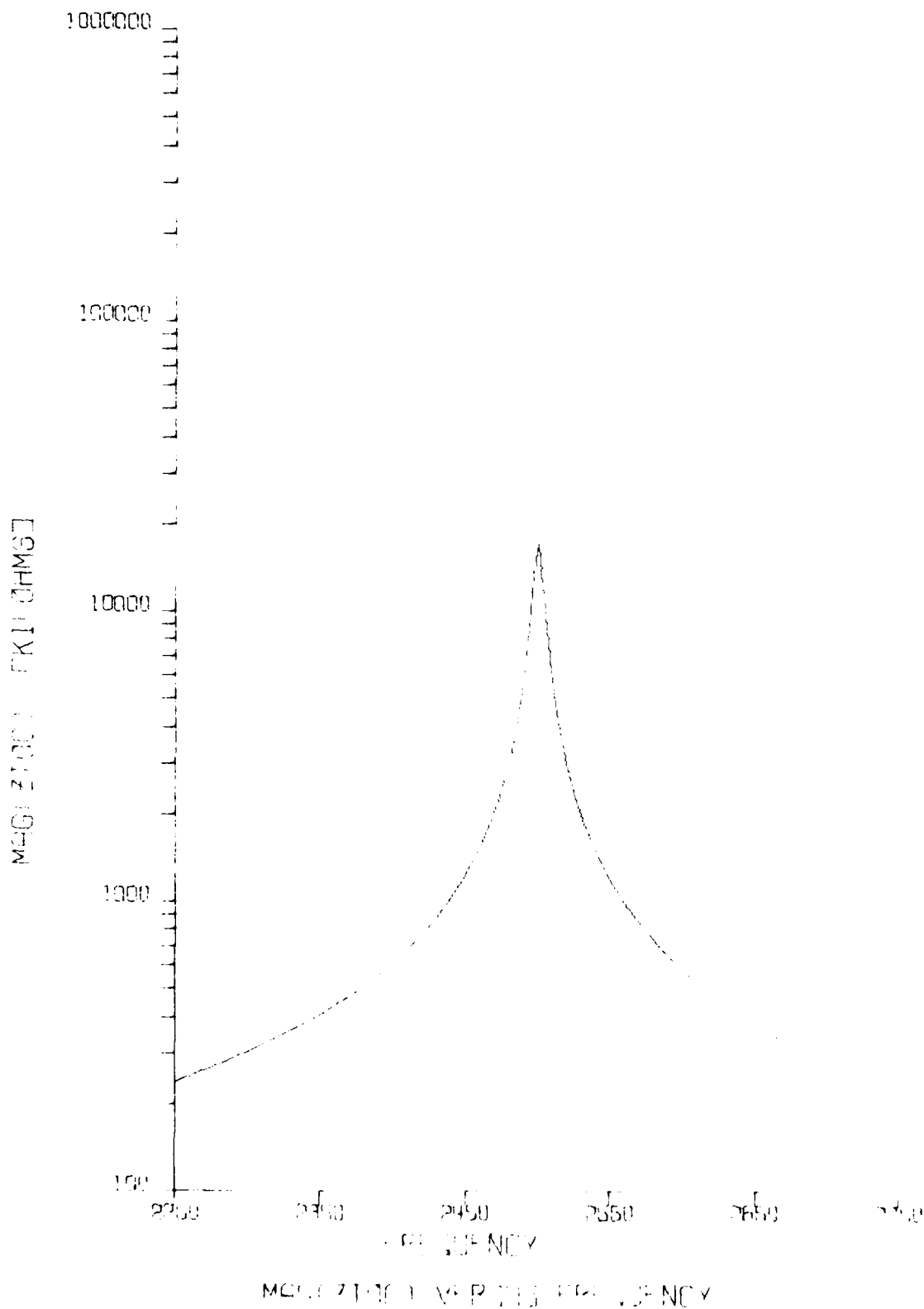
MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PR: $-8.62318751E03 + J3.54954775E03$
 CURVE 2 - MIN R: $-4.04152567E03 + J1.58332185E03$
 CURVE 3 - MAX X: $-4.71313038E03 + J6.22775241E03$
 CURVE 4 - MIN X: $-5.48191309E03 + J1.07796008E02$
 CURVE 5 - AVG: $-5.92089810E03 + J3.08428731E03$

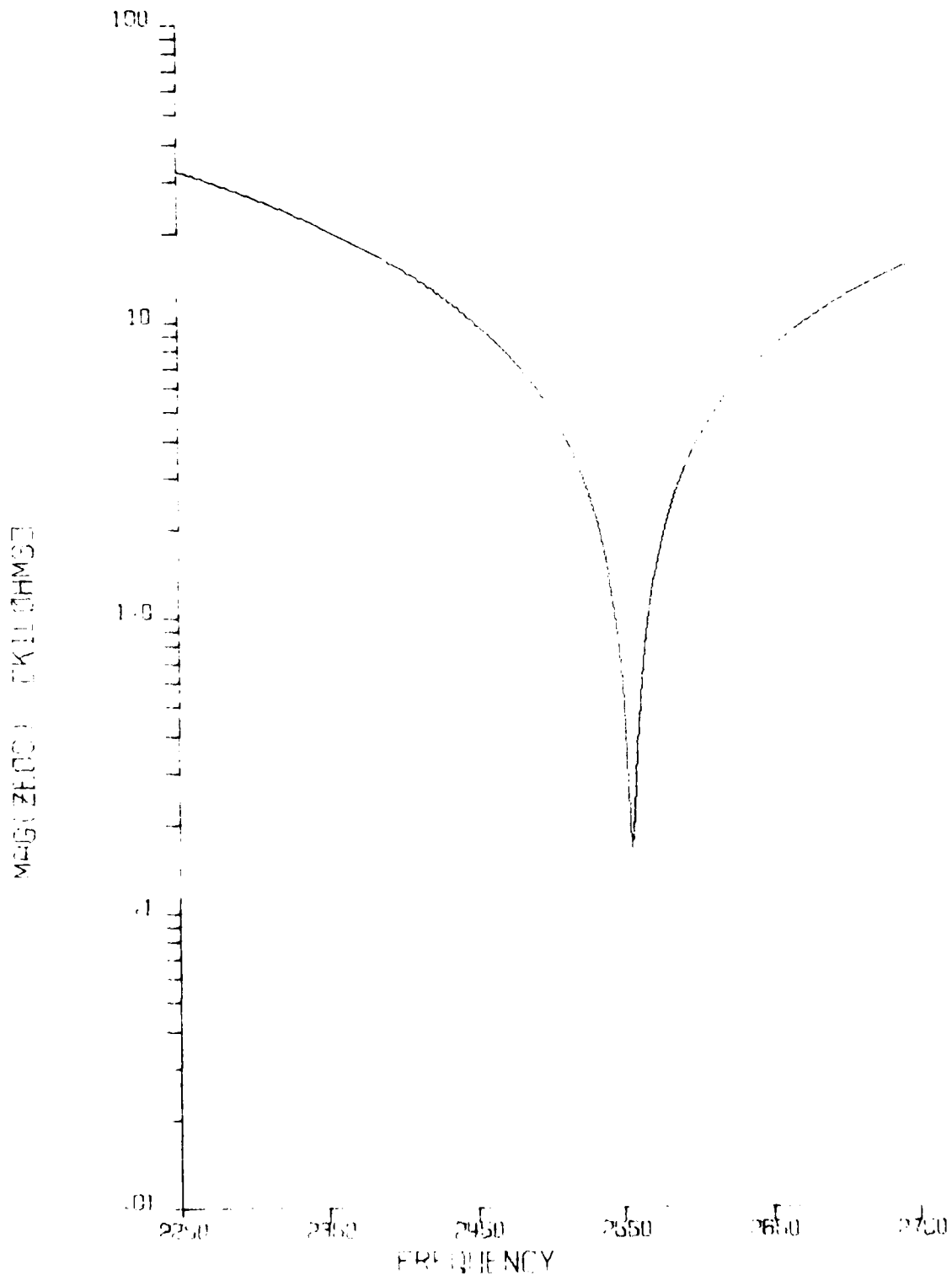
TRACOR, INC.

MID BAND

MID BAND
 TRG DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 LP=.4155 QP=E+50

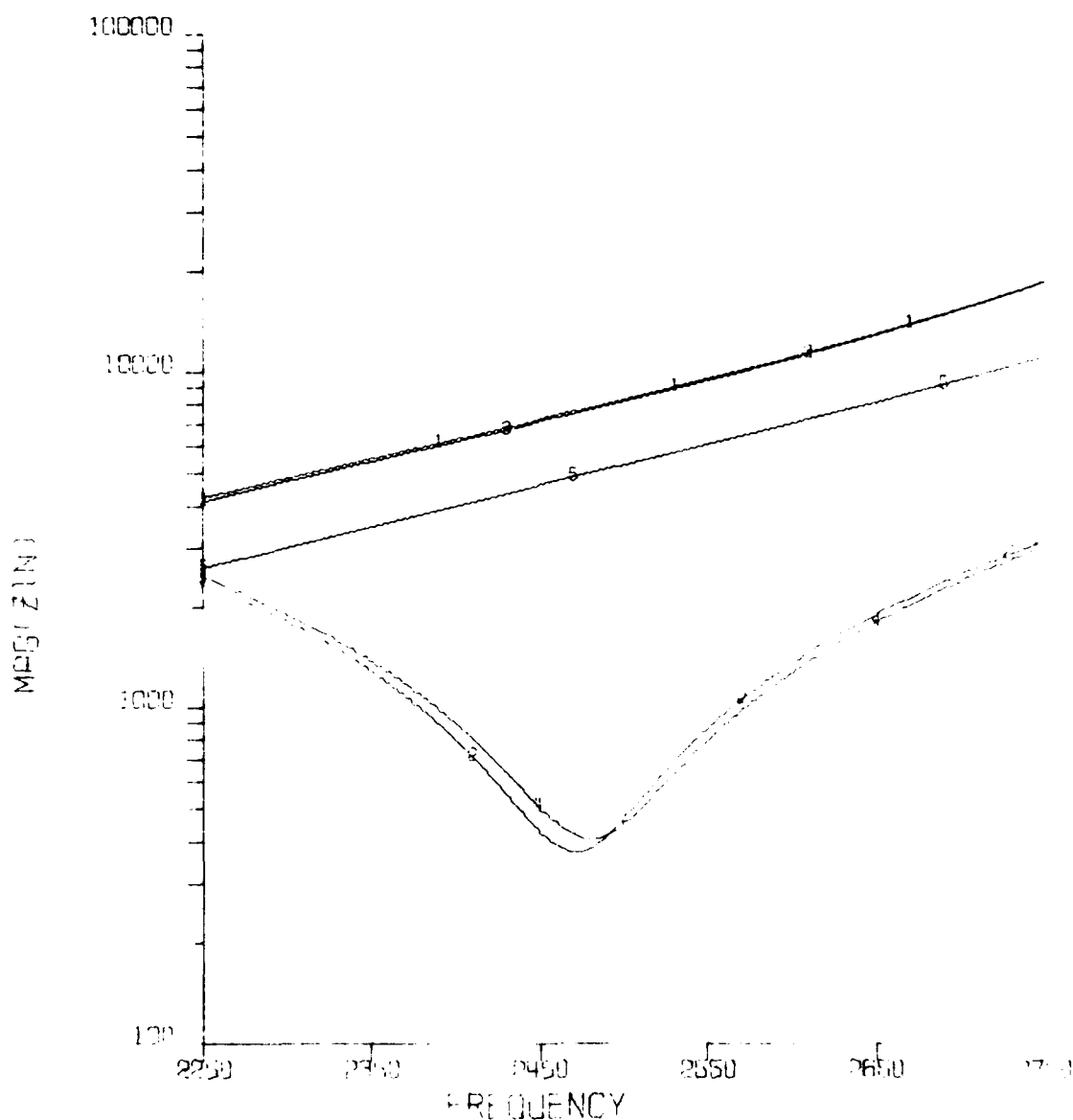


IRIS DUMILORD 1
 MID BAND
 C.P. 1 5 INCH CIRCULAR HEAD
 LP=.4155 QP=E+50



MAGNITUDE VERSUS FREQUENCY

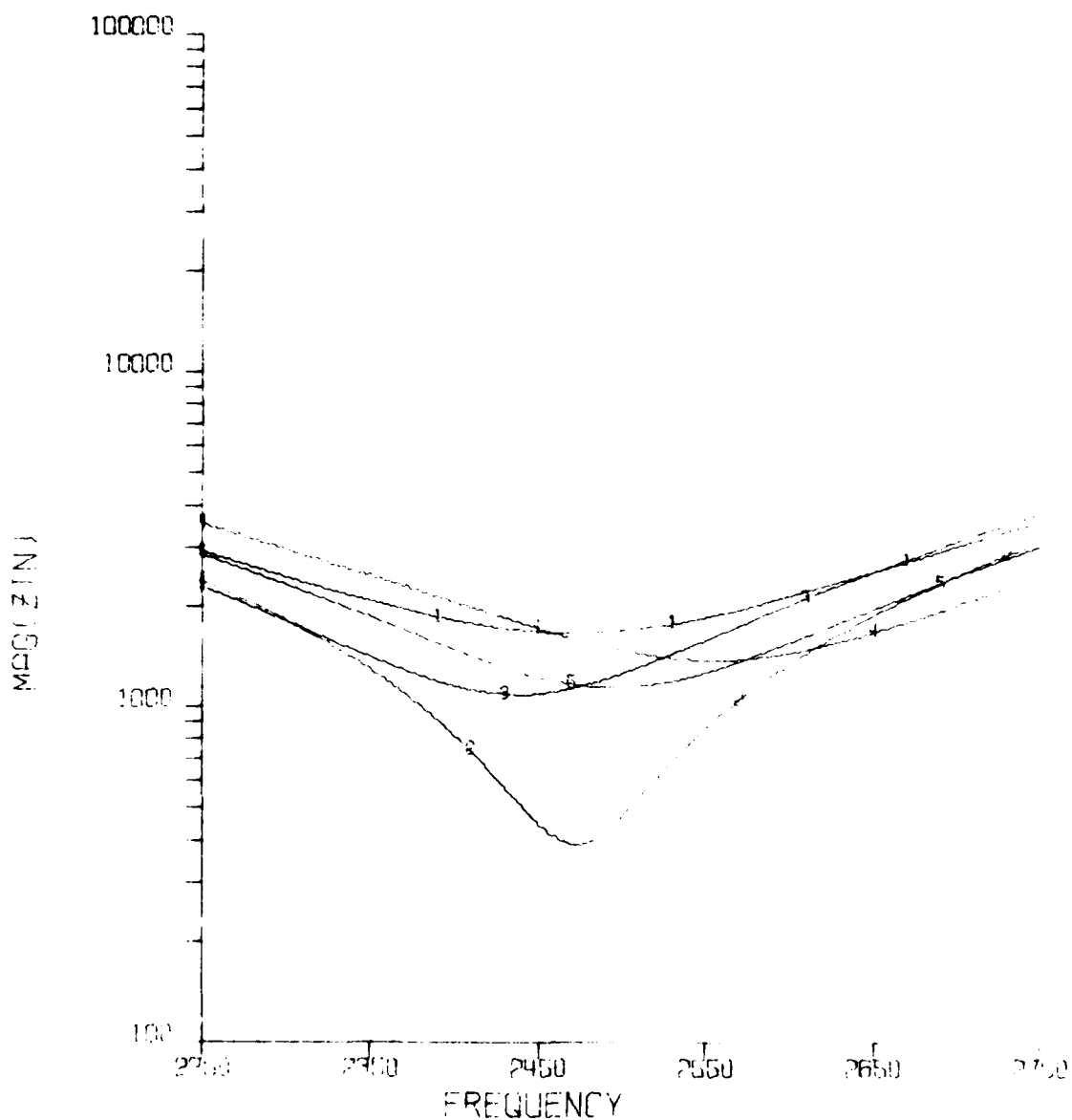
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=2.70694046E04+J7.66828215E04
 CURVE 2 - MIN R 2.48940781E03+J7.81876304E03
 CURVE 3 - MAX X 2.43145191E04+J7.70014272E04
 CURVE 4 - MIN X 2.80517428E03+J6.91990765E03
 CURVE 5 - AVG 2.81586841E04+J4.93015054E04

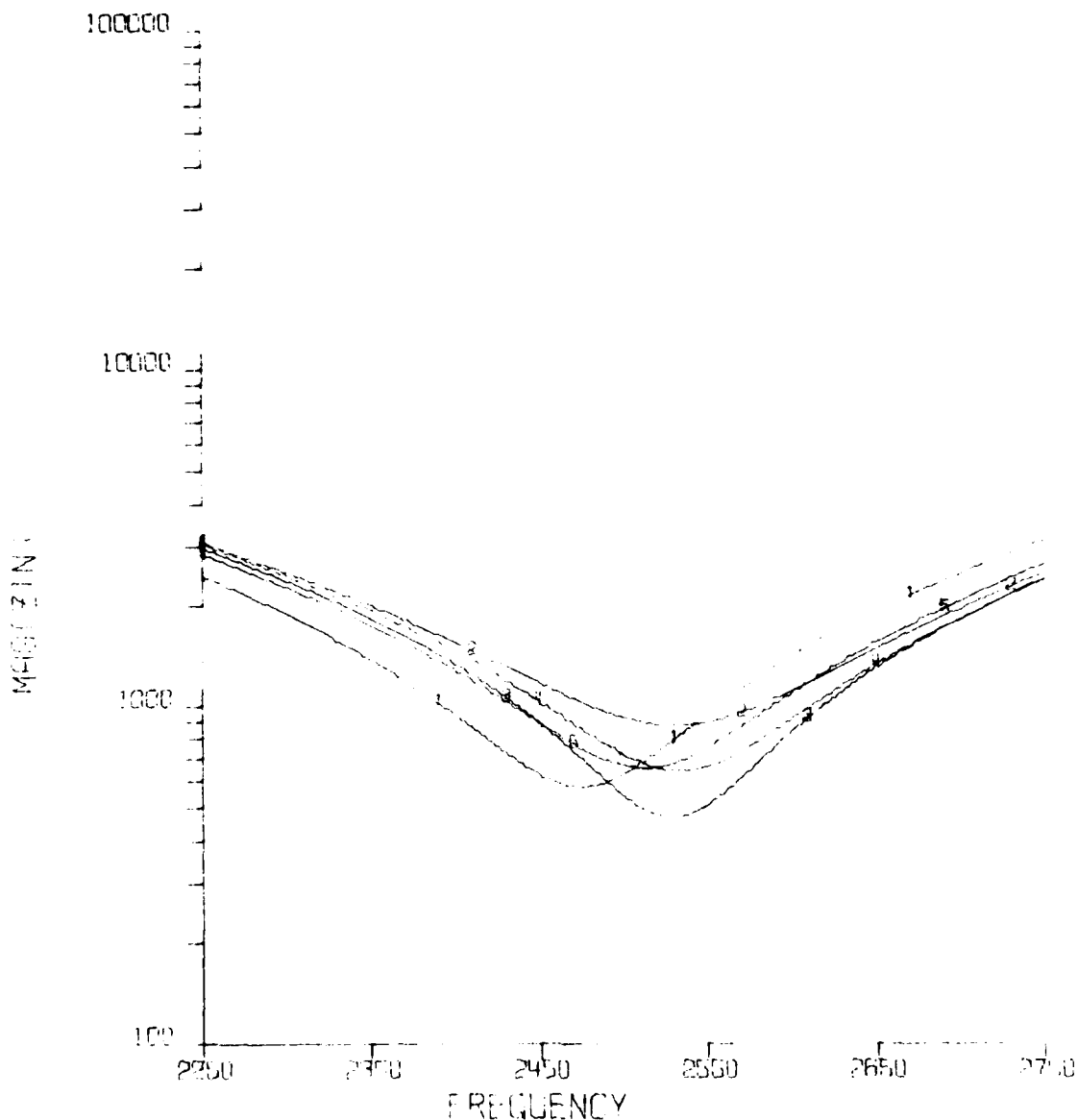
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4155 GP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =2.66139341E03+J7.66241486E05
 CURVE 3 - MAX X =1.07609438E04+J1.06830049E04
 CURVE 4 - MIN X =1.28174594E04-J9.89306251E02
 CURVE 5 - AVG =1.09317651E04+J4.93621119E03

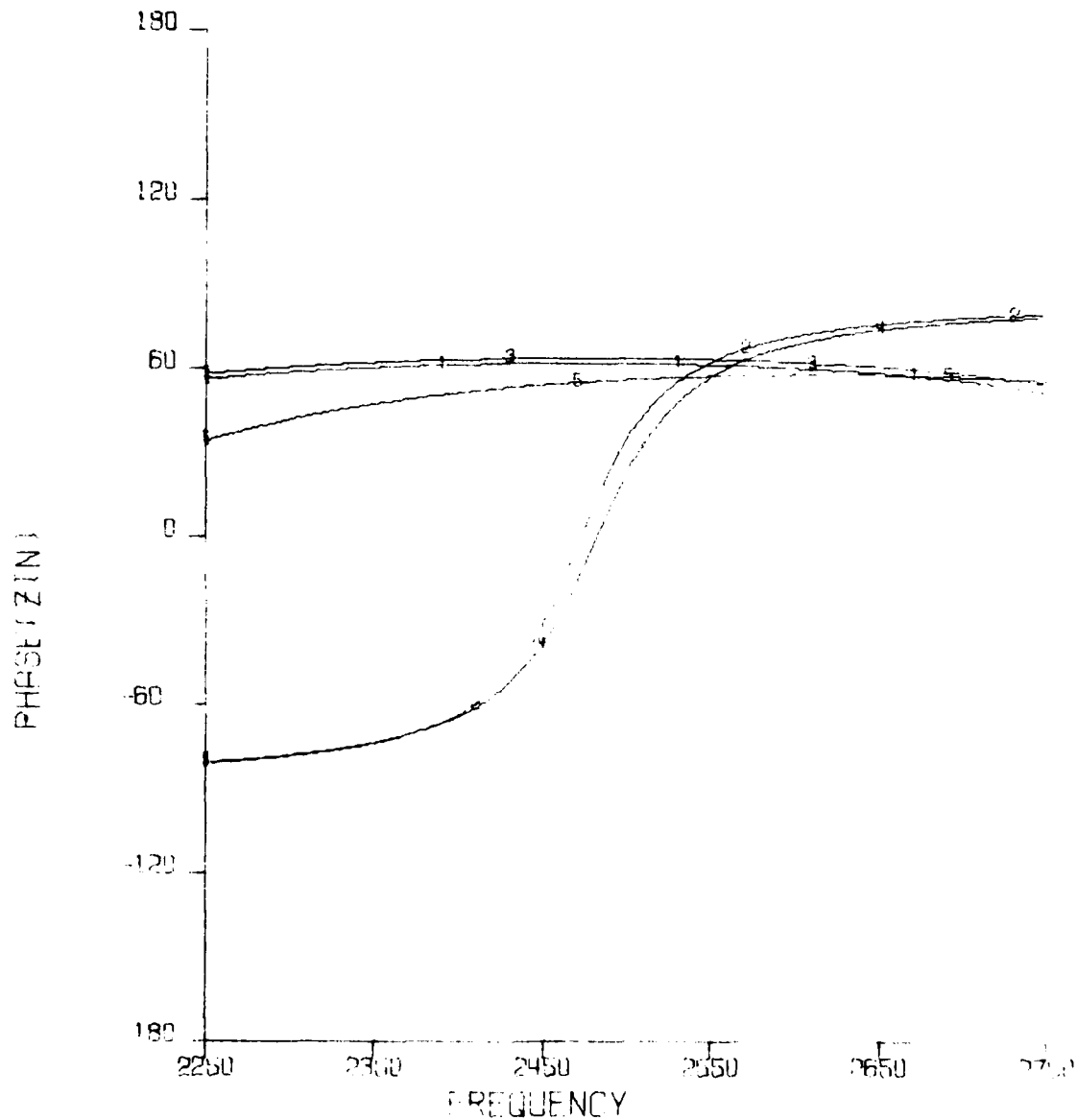
TRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4155 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R =8.18015867E03+J1.90704574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411690E03+J1.82754326E03
 CURVE 5 - AVG =6.13576911E03+J2.81425445E03

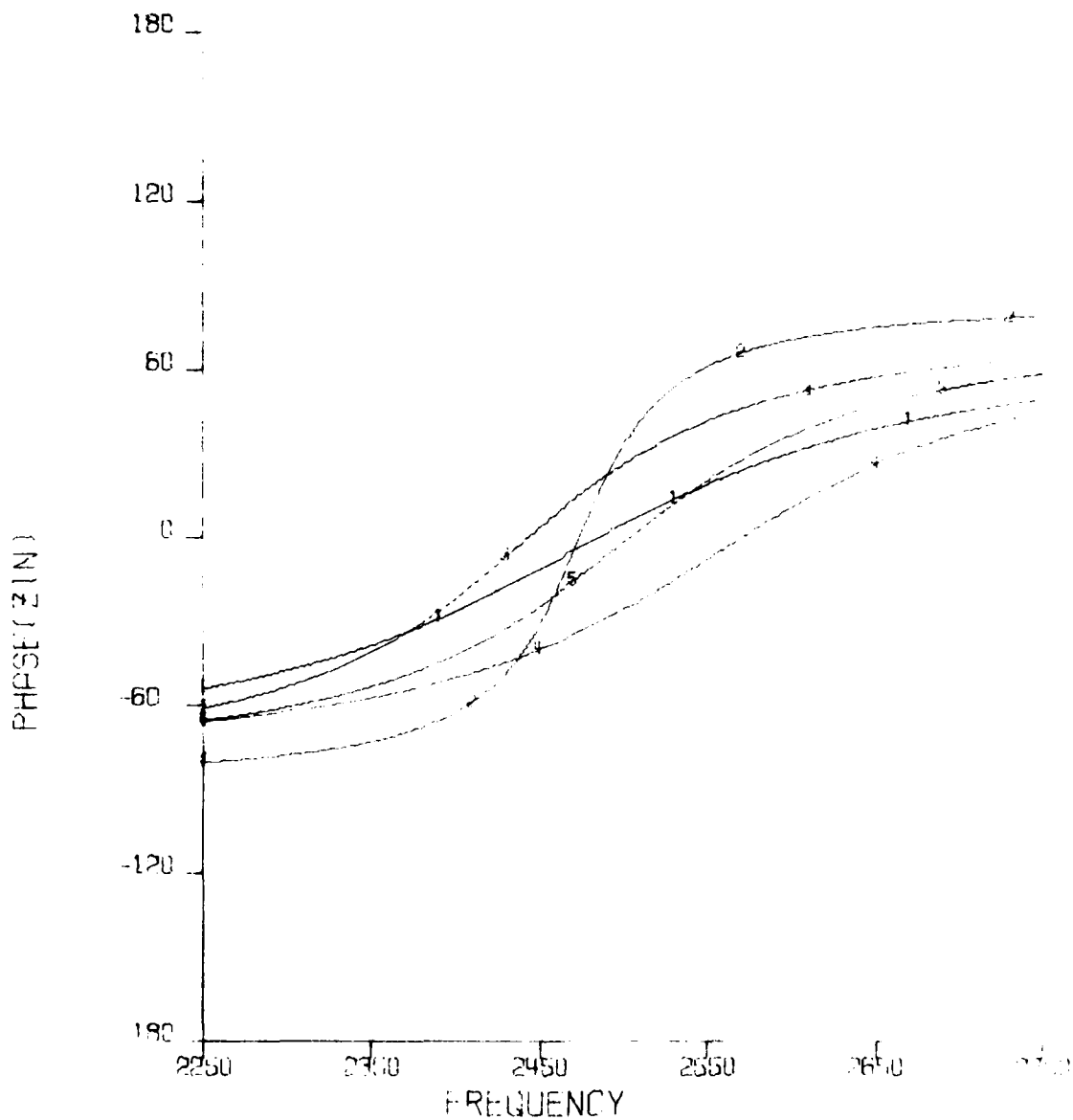
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRE $= 3.70694046E04 + J7.66828215E04$
 CURVE 2 - MIN R $= 3.48542781E03 + J7.81806304E03$
 CURVE 3 - MAX X $= 3.43145191E04 + J7.70014372E04$
 CURVE 4 - MIN X $= 3.80512498E03 + J6.91990765E03$
 CURVE 5 - AVG $= 2.91596841E04 + J4.83015054E04$

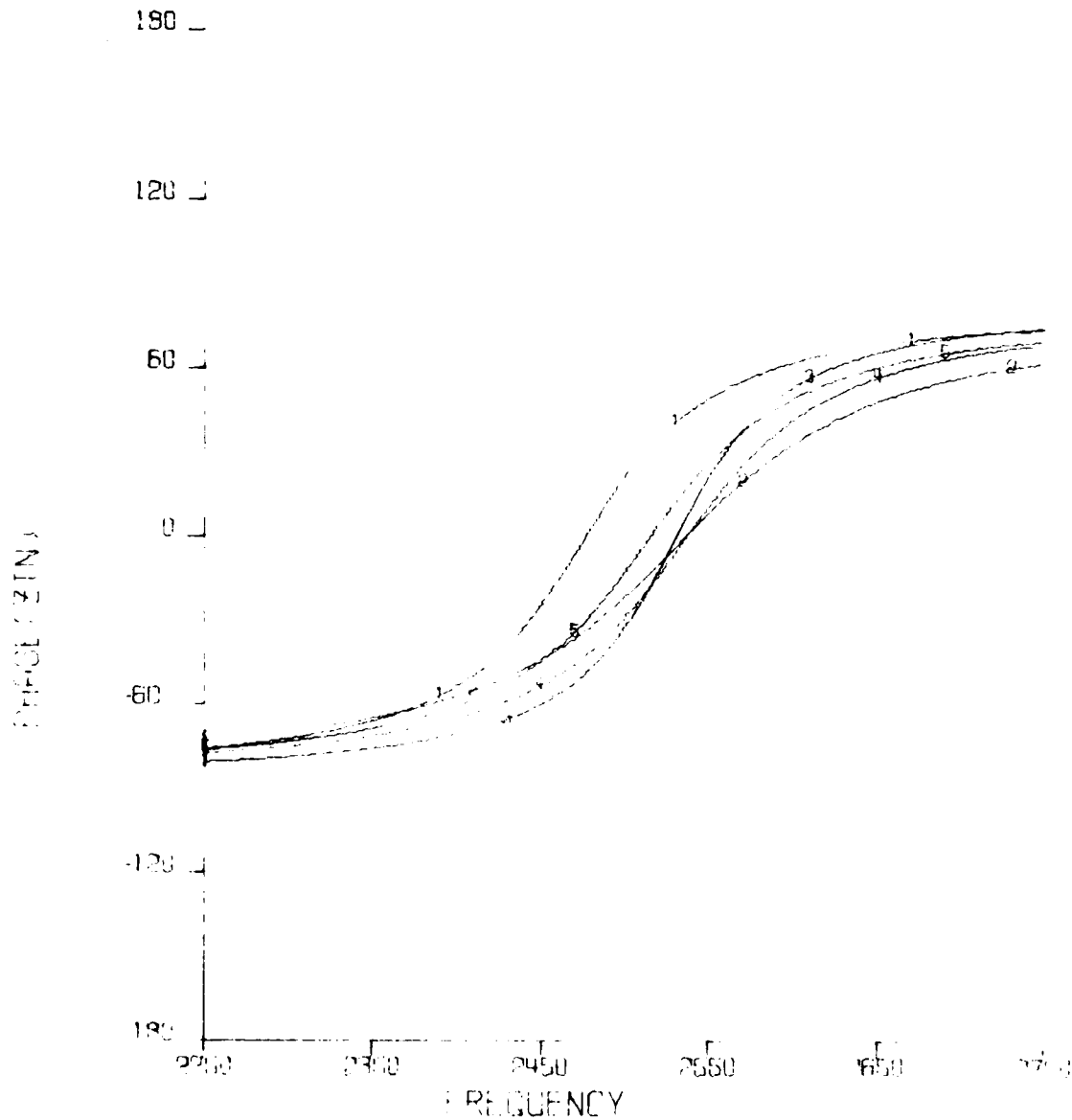
TRG DUMILOAD I
C.P. 1 5 INCH CIRCULAR HEAD
MID BAND 30 DEGREE (0.30)
LP=.4155 QP=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRE C=1.61847804E04+J6.64038697E03
CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
CURVE 3 - MAX X =1.07609438E04+J1.068380049E04
CURVE 4 - MIN X =1.278174594E04-J9.445386251E03
CURVE 5 - AVG =1.09357651E04+J4.33621119E03

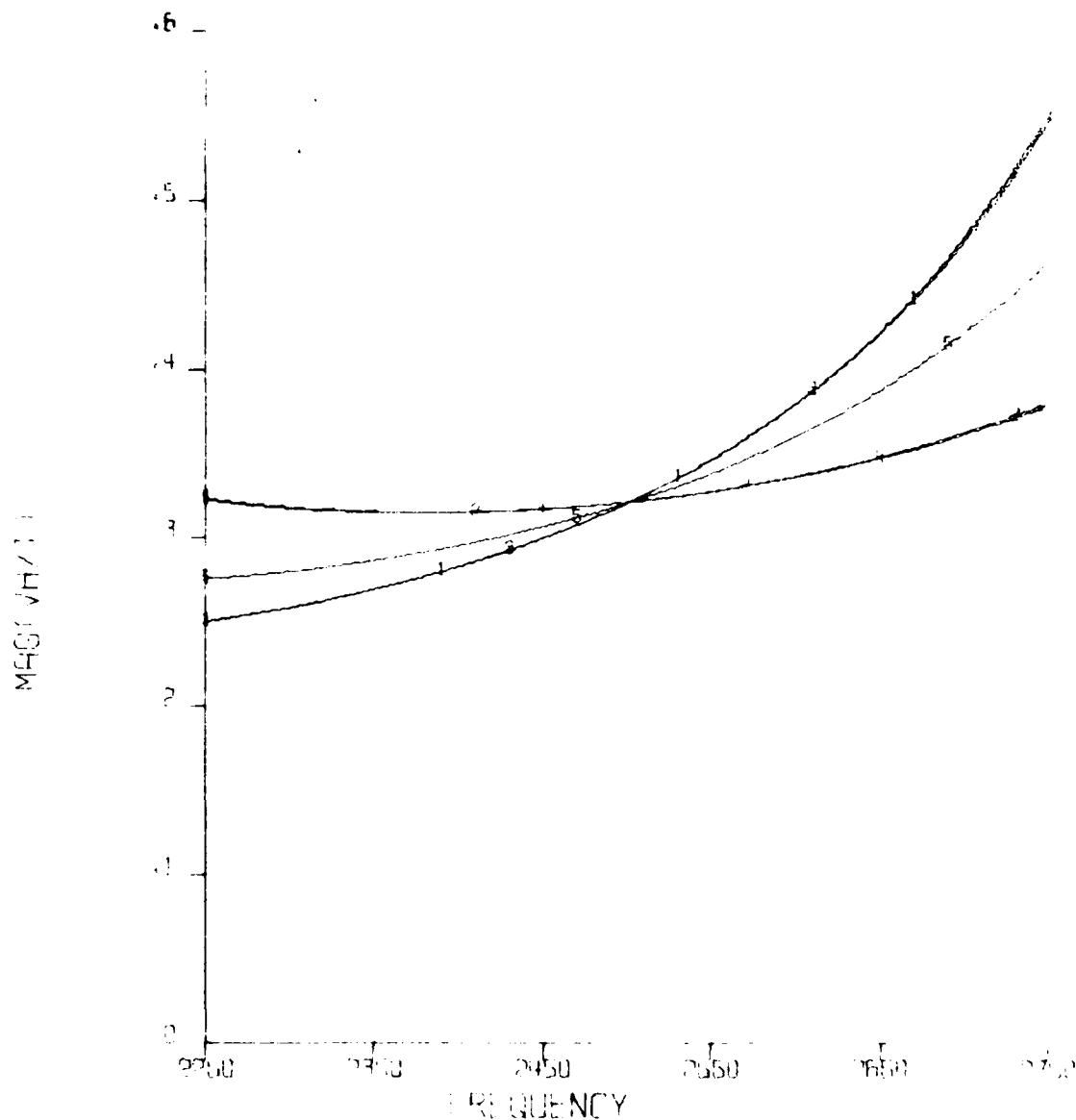
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4155 QP=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PHASE 5.50801644E03+J7.434690110E03
 CURVE 2 - MAX R 8.18015867E03+J1.00754574E03
 CURVE 3 - MIN R 4.73851865E03+J2.35230074E03
 CURVE 4 - MIN X 5.44411609E03+J1.80753276E03
 CURVE 5 - AVE 6.13576011E03+J3.81425445E03

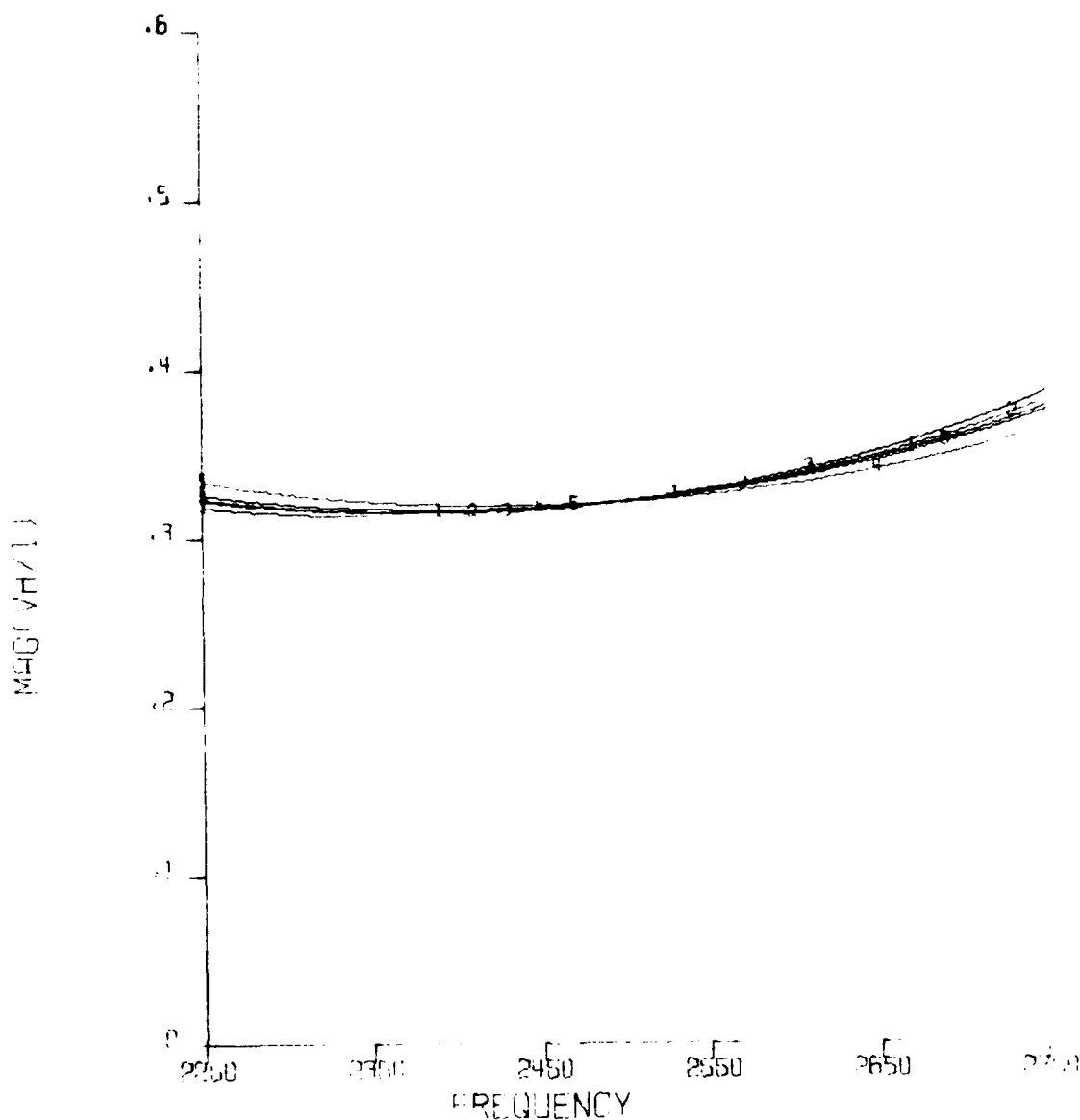
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



MAG (V/H/1) VERSUS FREQUENCY

CURVE 1	= MAX P	13.70691646E04+J7.66878715E04
CURVE 2	= MIN P	13.44849781E04+J7.81806304E03
CURVE 3	= MAX X	13.43145191E04+J7.70014213E04
CURVE 4	= MIN X	13.83512498E04+J6.29194036E03
CURVE 5	= A-B	13.81590841E04+J4.9150094E04

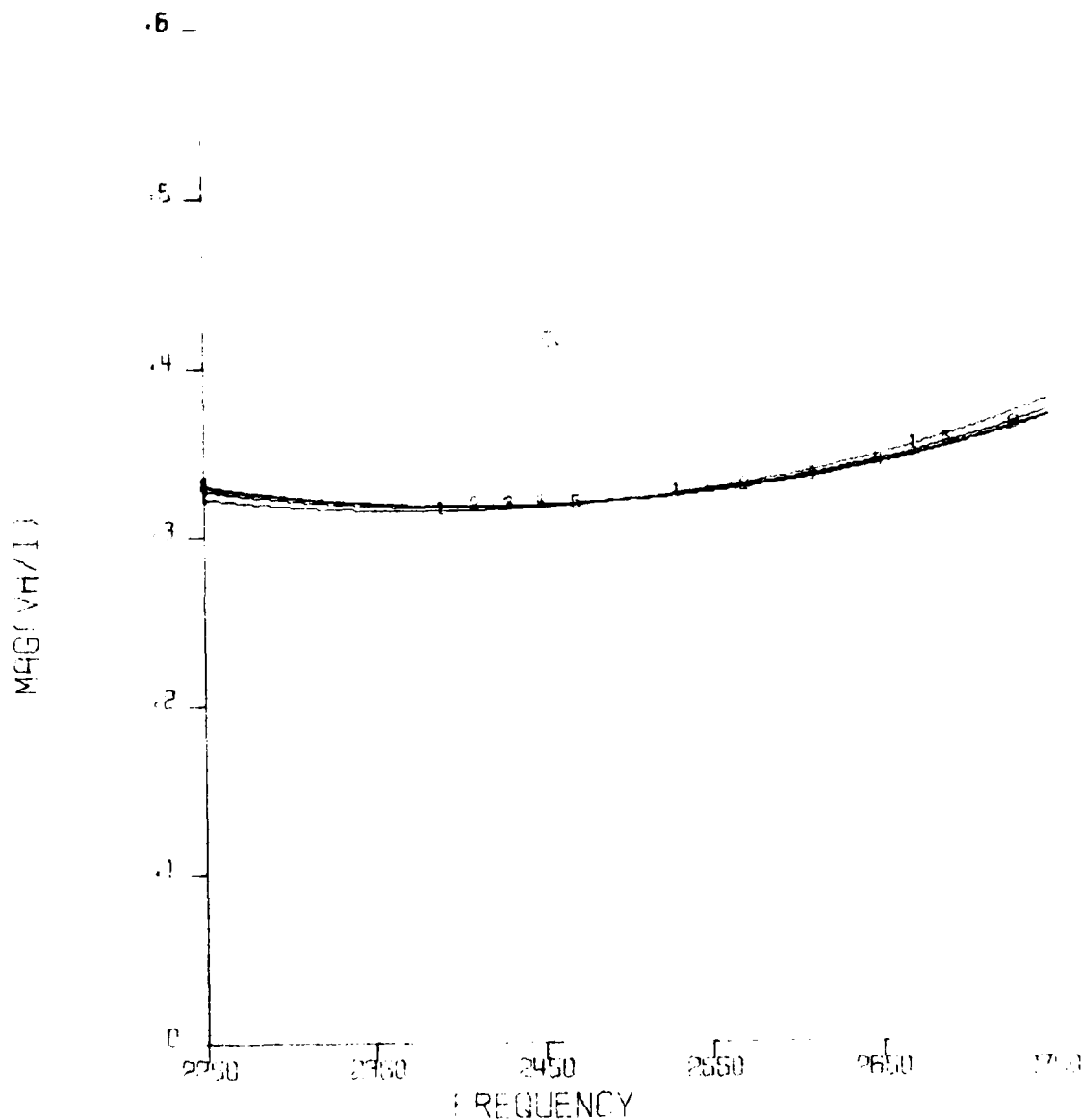
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4155 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64032697E03
 CURVE 2 - MIN R =3.86139341E03+J7.66241496E03
 CURVE 3 - MAX X =1.07609432E04+J1.06836049E04
 CURVE 4 - MIN X =-1.78174594E04-J9.95286251E03
 CURVE 5 - AVG =1.02337651E04+J4.98621119E03

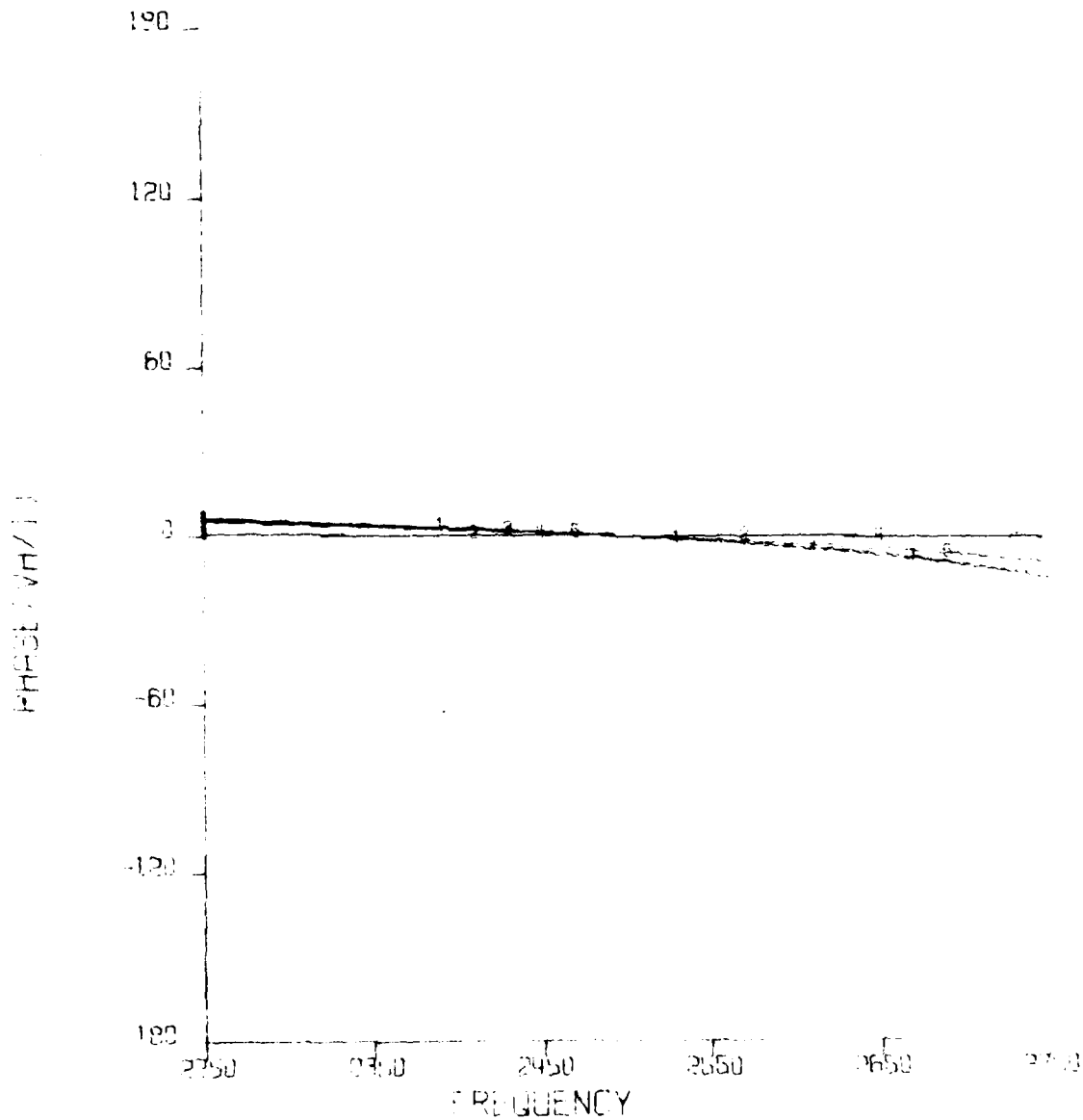
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4155 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R =8.18015867E03+J1.90754574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.94411695E03+J1.82757376E03
 CURVE 5 - AVG =6.13526911E03+J3.81425445E03

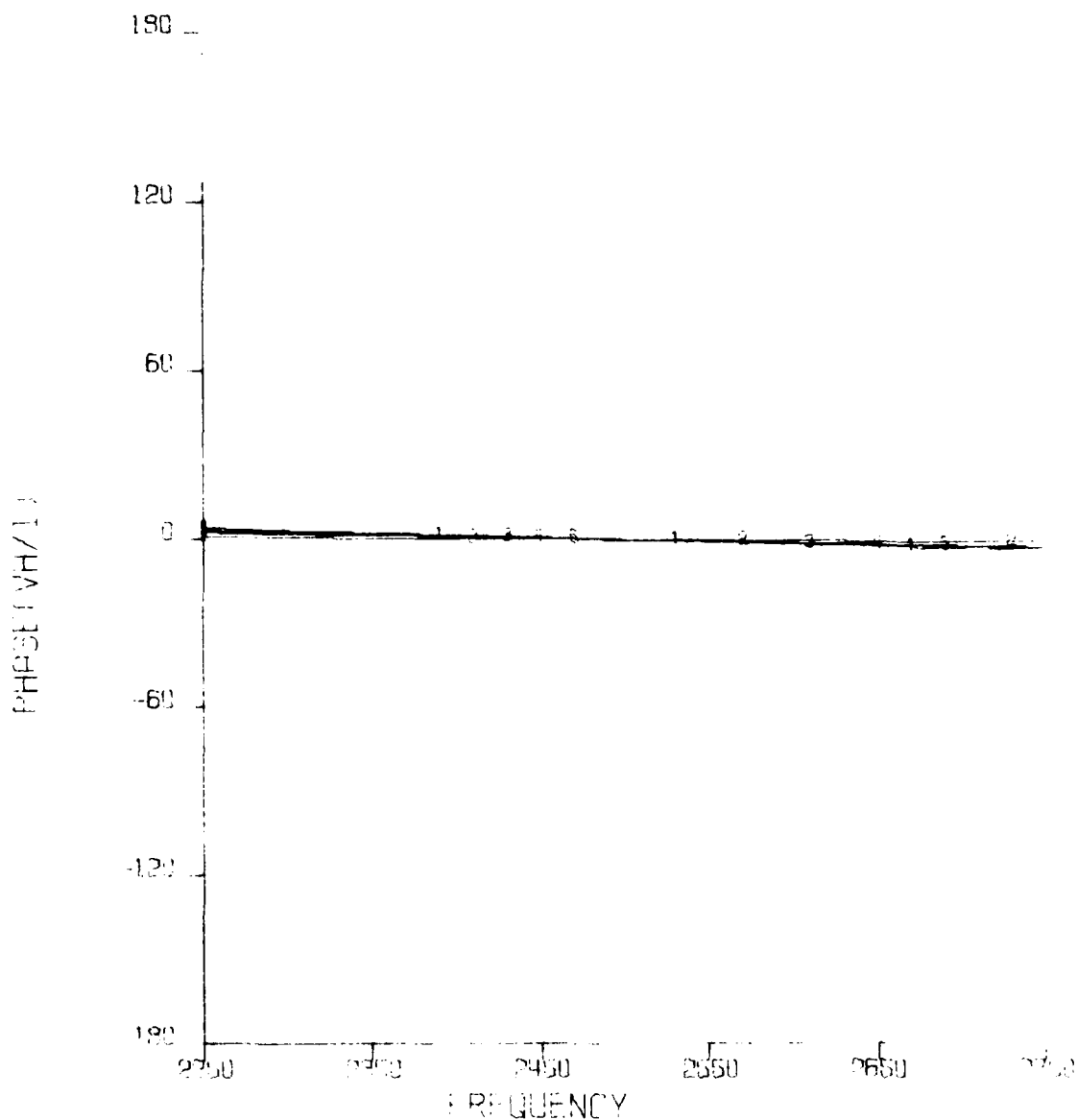
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.4155 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES - 3.20690046E04+J7.66898715E04
 CURVE 2 - MIN R - 3.149842791E03+J7.81806704E03
 CURVE 3 - MAX X - 2.43145101E04+J7.76014212E04
 CURVE 4 - MIN X - 3.9751249E-03+J6.21900765E03
 CURVE 5 - AVG - 2.81520841E-04+J4.93015104E04

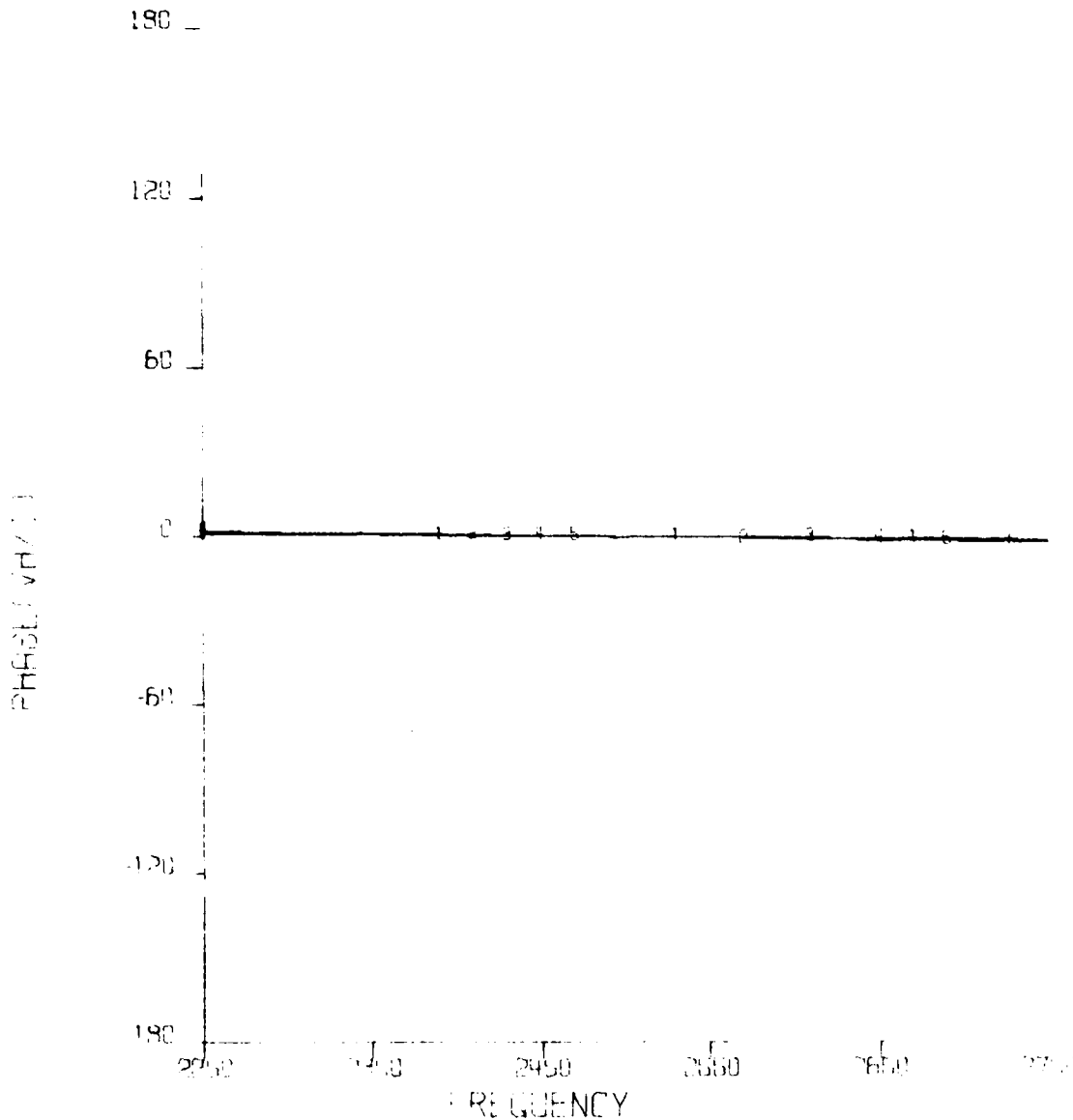
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0,30)
 LP=.4155 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038687E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06838049E04
 CURVE 4 - MIN X =1.78174594E04-J9.95386251E02
 CURVE 5 - AVG =1.409357651E04+J4.29811119E03

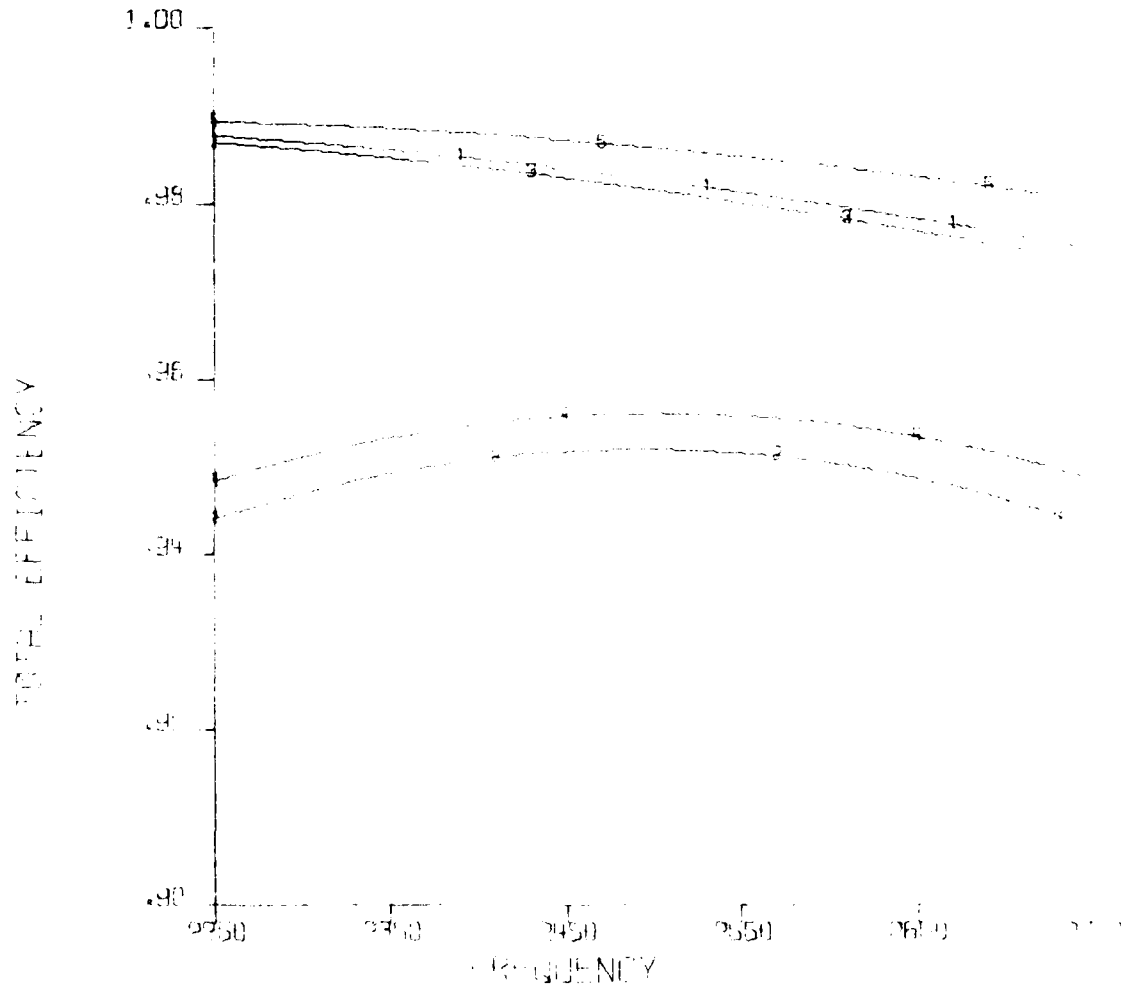
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4155 GP=E+50



PHASE (deg) VERSUS FREQUENCY

CURVE 1 - MAX PRG 5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R 8.13015864E03+J1.90754574E03
 CURVE 3 - MIN R 4.22951865E03+J2.39230074E03
 CURVE 4 - MIN X 5.94411695E03+J1.87753776E03
 CURVE 5 - AVG 6.13506911E03+J3.81425445E03

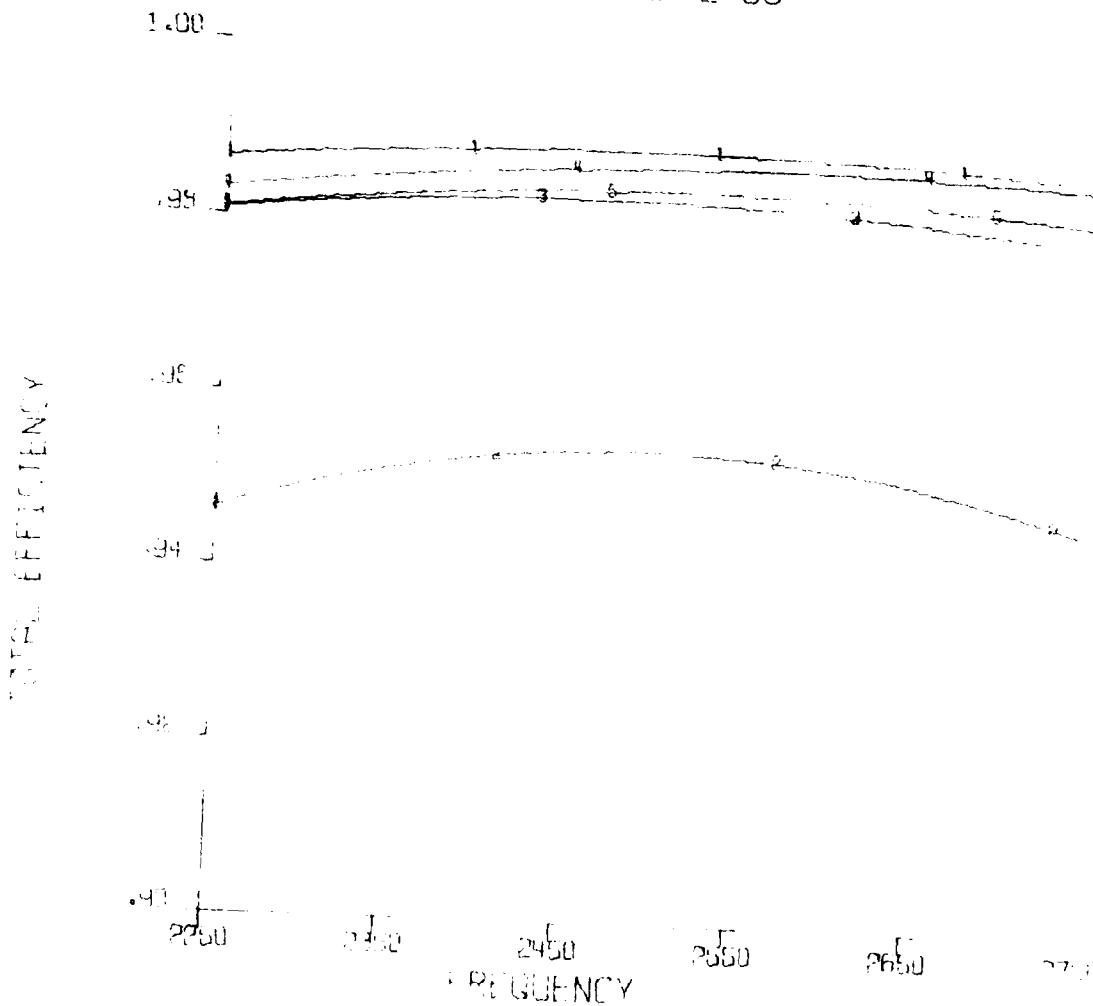
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



TOTAL EFFICIENCY VERTING FREQUENCY

CURVE 1	= MAX R	2.73694E+16	1.44376E+9	1.1E-4
CURVE 2	= MIN R	2.40940E+16	1.34178E+9	1.1E-4
CURVE 3	= MAX X	2.43145E+16	1.44376E+9	1.1E-4
CURVE 4	= MIN X	2.40940E+16	1.34178E+9	1.1E-4
CURVE 5	= AVG	2.81594E+16	1.44376E+9	1.1E-4

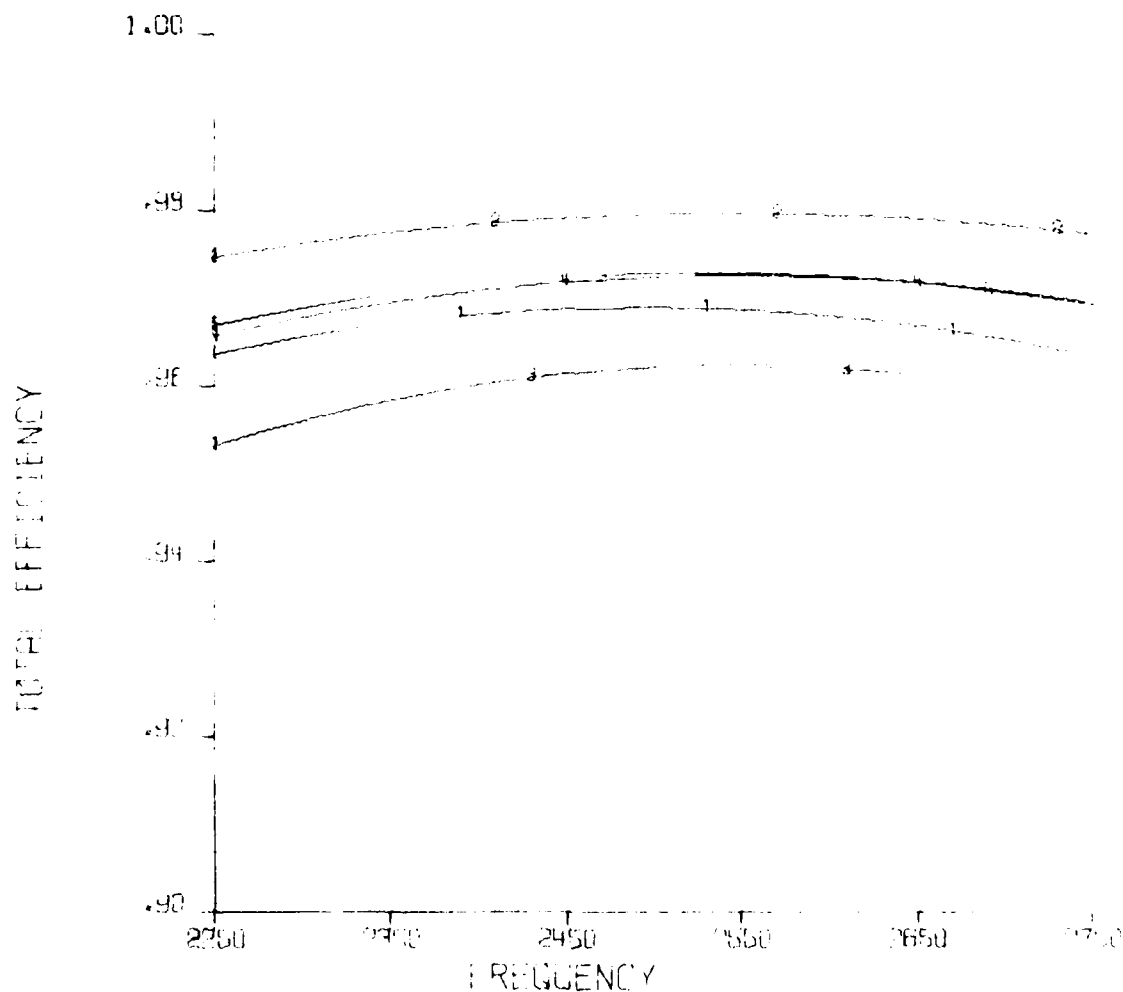
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0,30)
 LP=.4155 QP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES	$1.61847954E04 + J6.64038697E03$
CURVE 2 - MIN P	$3.66134741E03 + J7.6674148E03$
CURVE 1 - MAX X	$1.07600438E04 + J1.0688E04$
CURVE 2 - MIN X	$1.78174594E04 + J4.90386351E03$
CURVE 1 - AVG	$1.30747651E04 + J4.23671118E03$

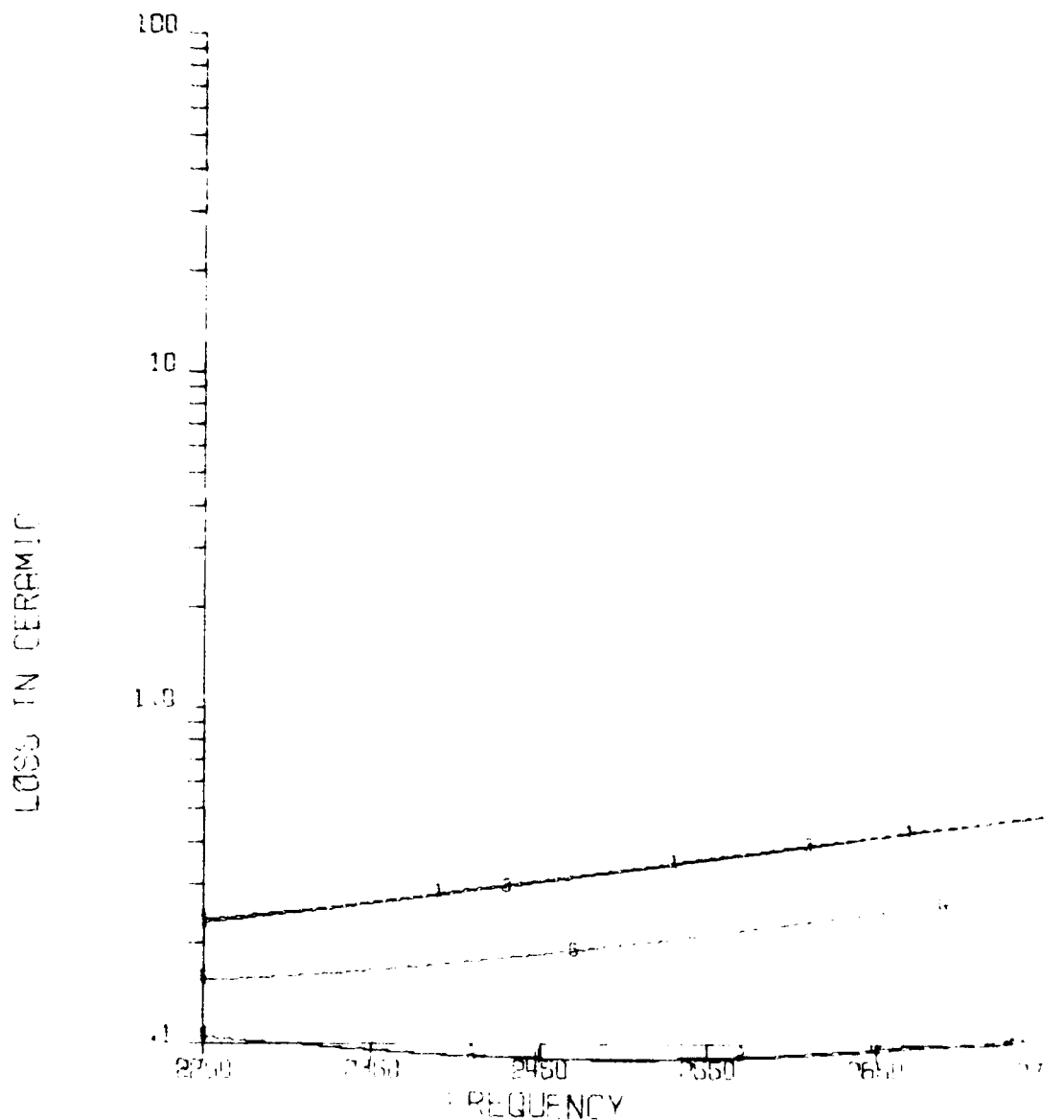
TRG DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0,90)
 LP=.4155 GP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRE=5.50801644E-03+J7.43469913E-03
 CURVE 2 - MAX R =8.18015867E-03+J1.102704574E-02
 CURVE 3 - MIN R =4.27951965E-03+J0.29030074E-02
 CURVE 4 - MIN X =5.94411693E-03+J1.89273276E-02
 CURVE 5 - AVG =6.13526911E-03+J3.81423445E-03

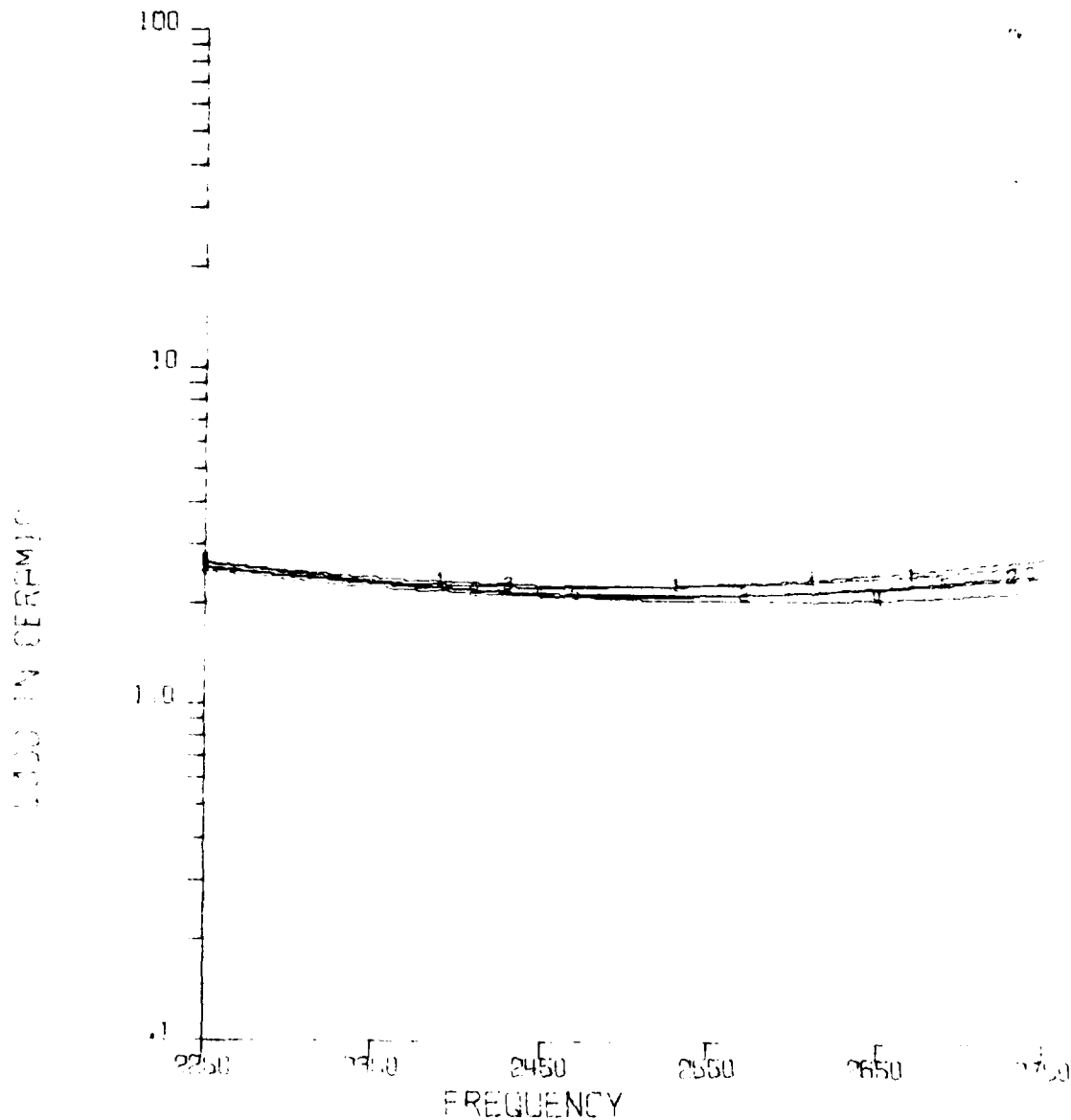
TR6 DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PR 0E3.70694046E04+J7.66828.10E04
 CURVE 2 - MIN R 0E3.48842781E03+J7.81896344E03
 CURVE 3 - MAX X 0E3.42145191E04+J7.70014277E04
 CURVE 4 - MIN X 0E3.80512408E03+J6.91000703E03
 CURVE 5 - AVG 0E3.81540841E04+J6.84115159E04

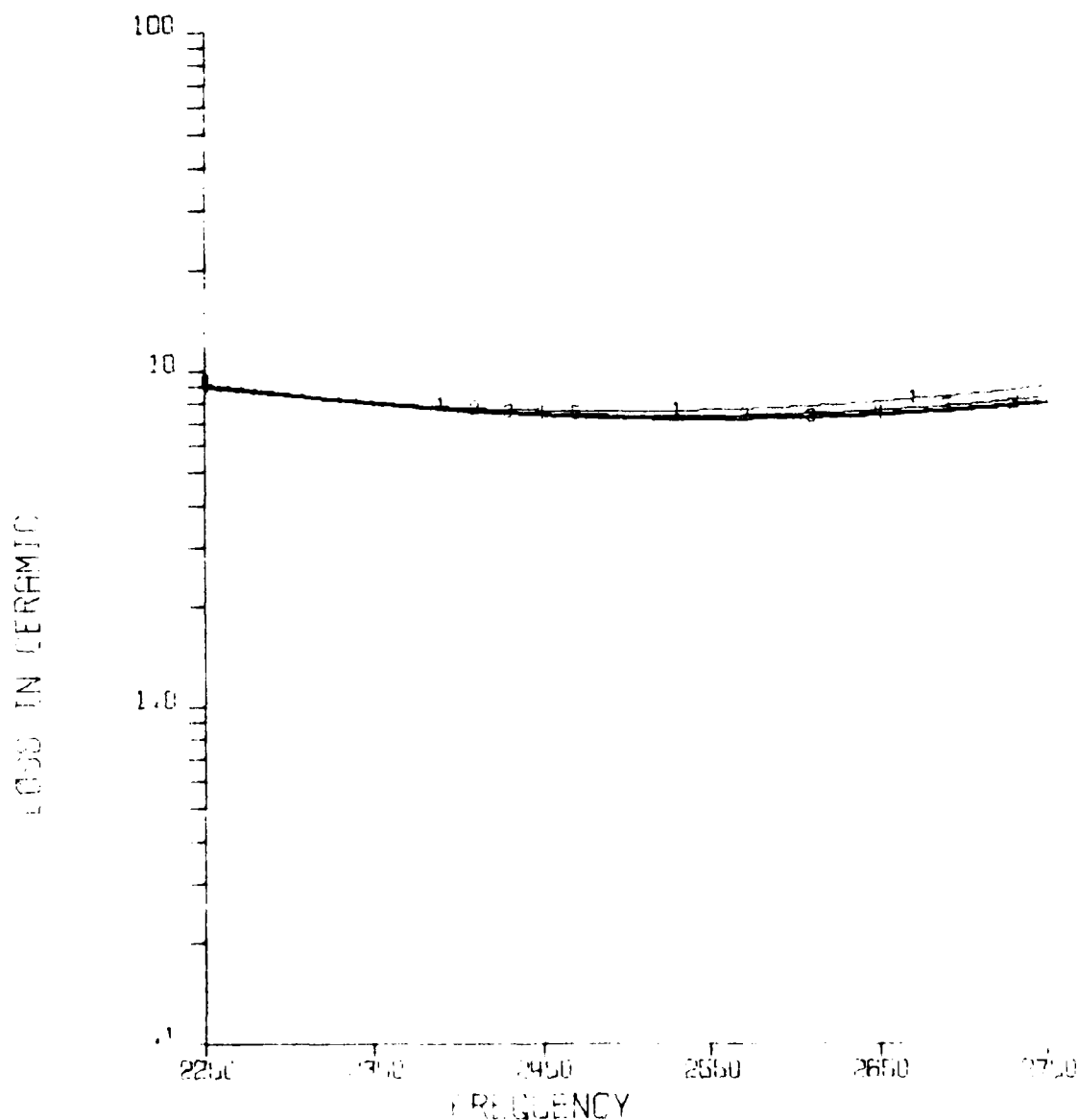
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4155 GP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04+J9.30386351E03
 CURVE 5 - AVG =1.09357651E04+J4.30871119E03

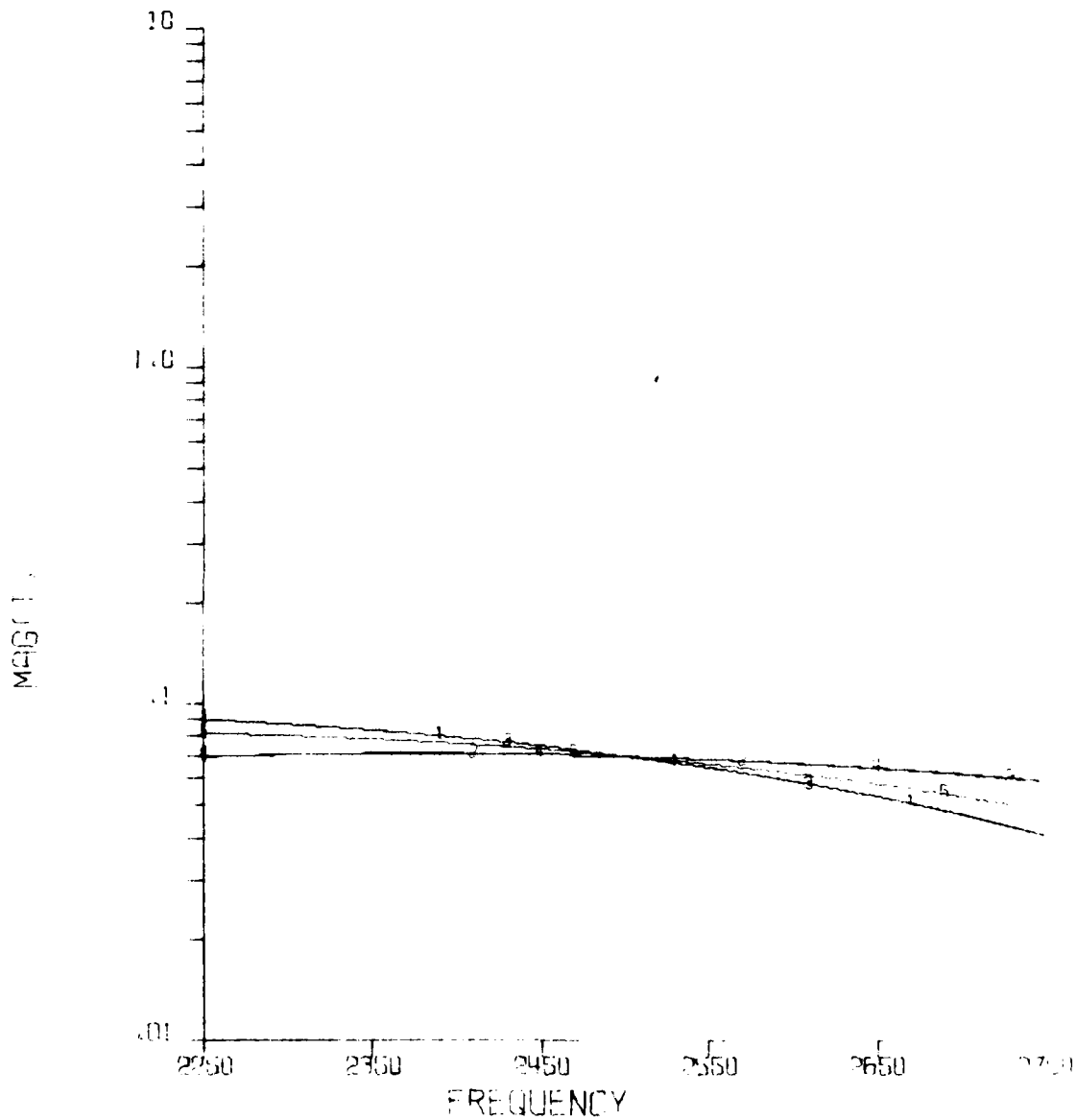
TRG DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0,90)
 LP=.4155 GP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43468819E03
 CURVE 2 - MAX R =9.18015867E03+J1.90734574E03
 CURVE 3 - MIN R =4.27851865E03+J2.38239074E03
 CURVE 4 - MIN X =5.30441168E03+J1.82753306E03
 CURVE 5 - AVG =6.13526911E03+J3.81425445E03

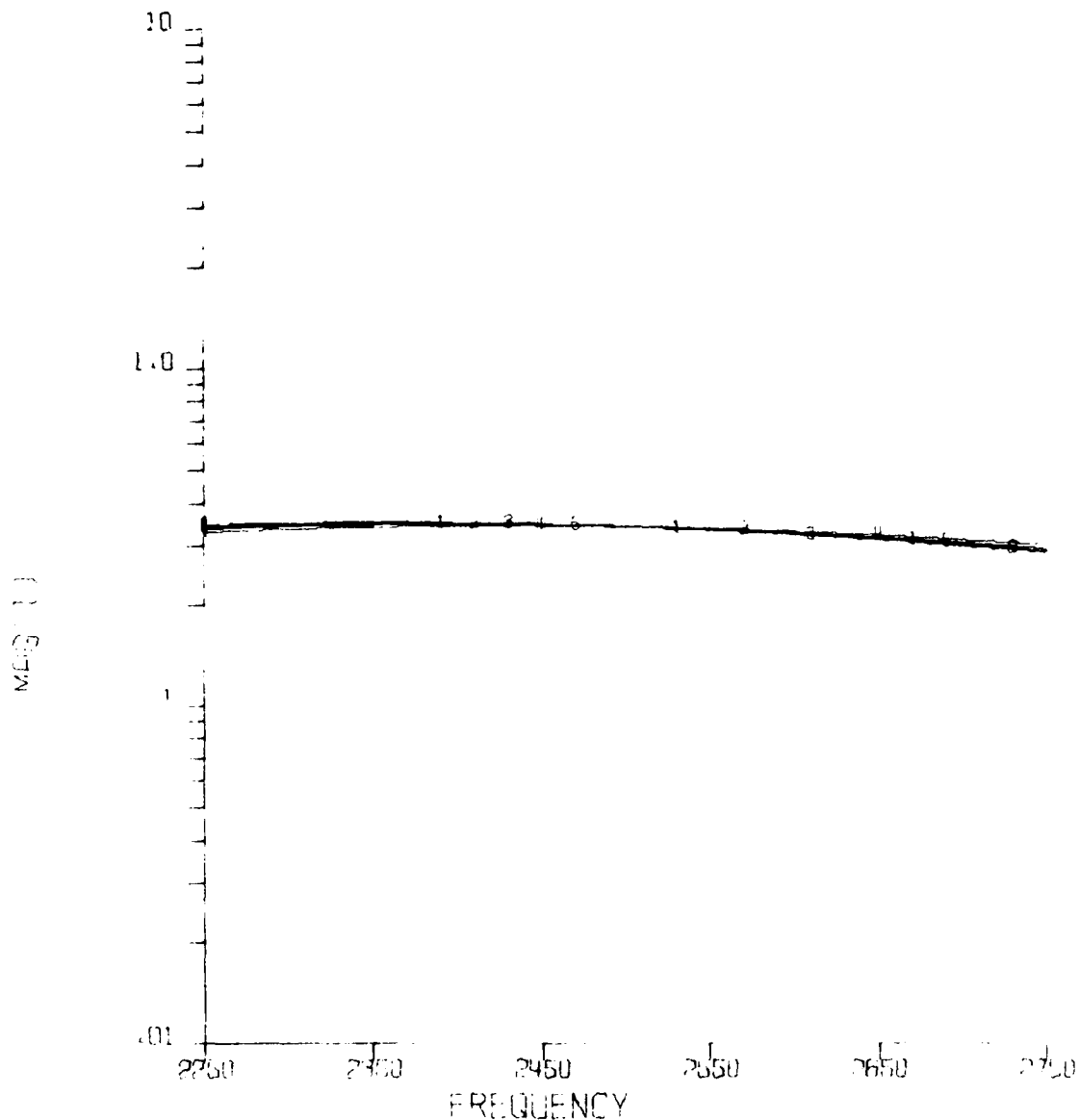
TRG DUMIL040 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES	$-3.70694046E+04 + J7.66828915E+04$
CURVE 2 - MIN R	$-3.48842781E+03 + J7.81806304E+03$
CURVE 3 - MAX X	$-3.43145191E+04 + J7.70014372E+04$
CURVE 4 - MIN X	$-3.80510498E+03 + J6.91990765E+03$
CURVE 5 - AVG	$-3.81596841E+04 + J7.94711054E+04$

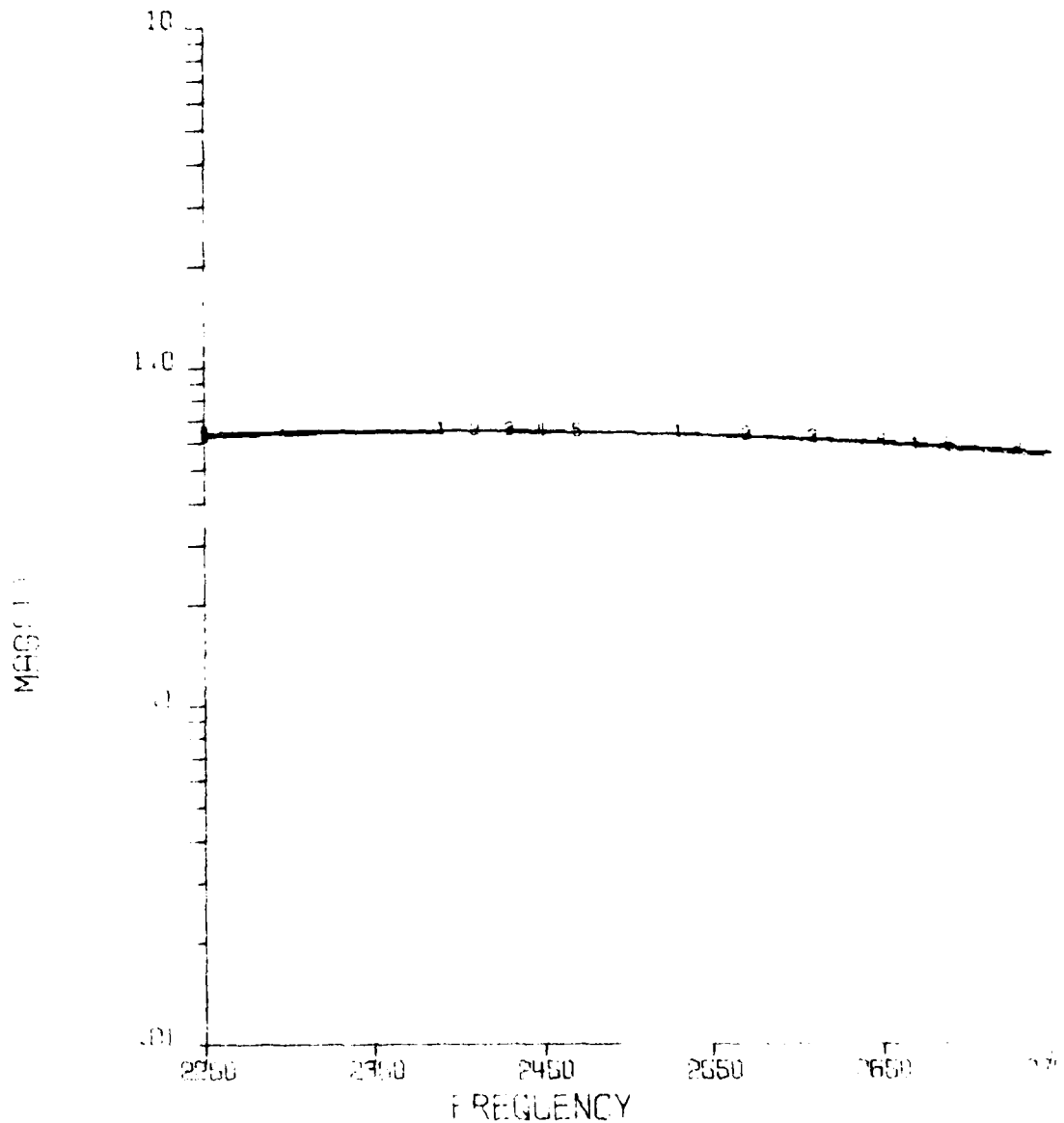
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4155 QP=E+50



MAG(1) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66134341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609428E04+J1.06836044E04
 CURVE 4 - MIN X =1.08174594E04+J9.30386351E03
 CURVE 5 - REF =1.09357651E04+J4.13821119E03

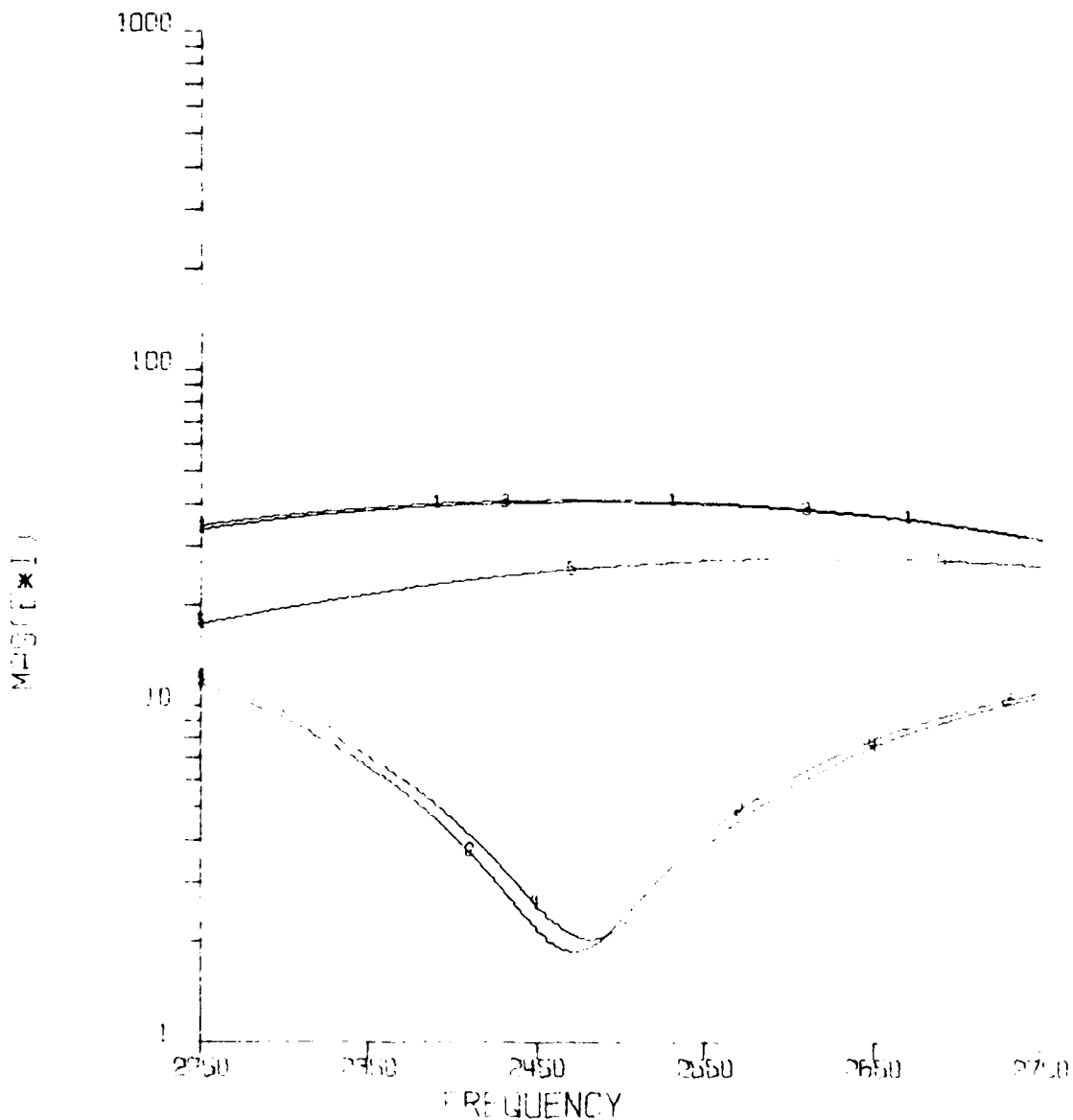
TRG DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4155 GP=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PREC=5.50801644E03+J07.43460011E02
 CURVE 2 - MAX R =8.18015867E03+J01.27704573E03
 CURVE 3 - MIN R =4.27851865E03+J02.38039074E02
 CURVE 4 - MIN X =6.29441169E03+J01.29771237E02
 CURVE 5 - AVE =6.13576911E03+J02.29142044E02

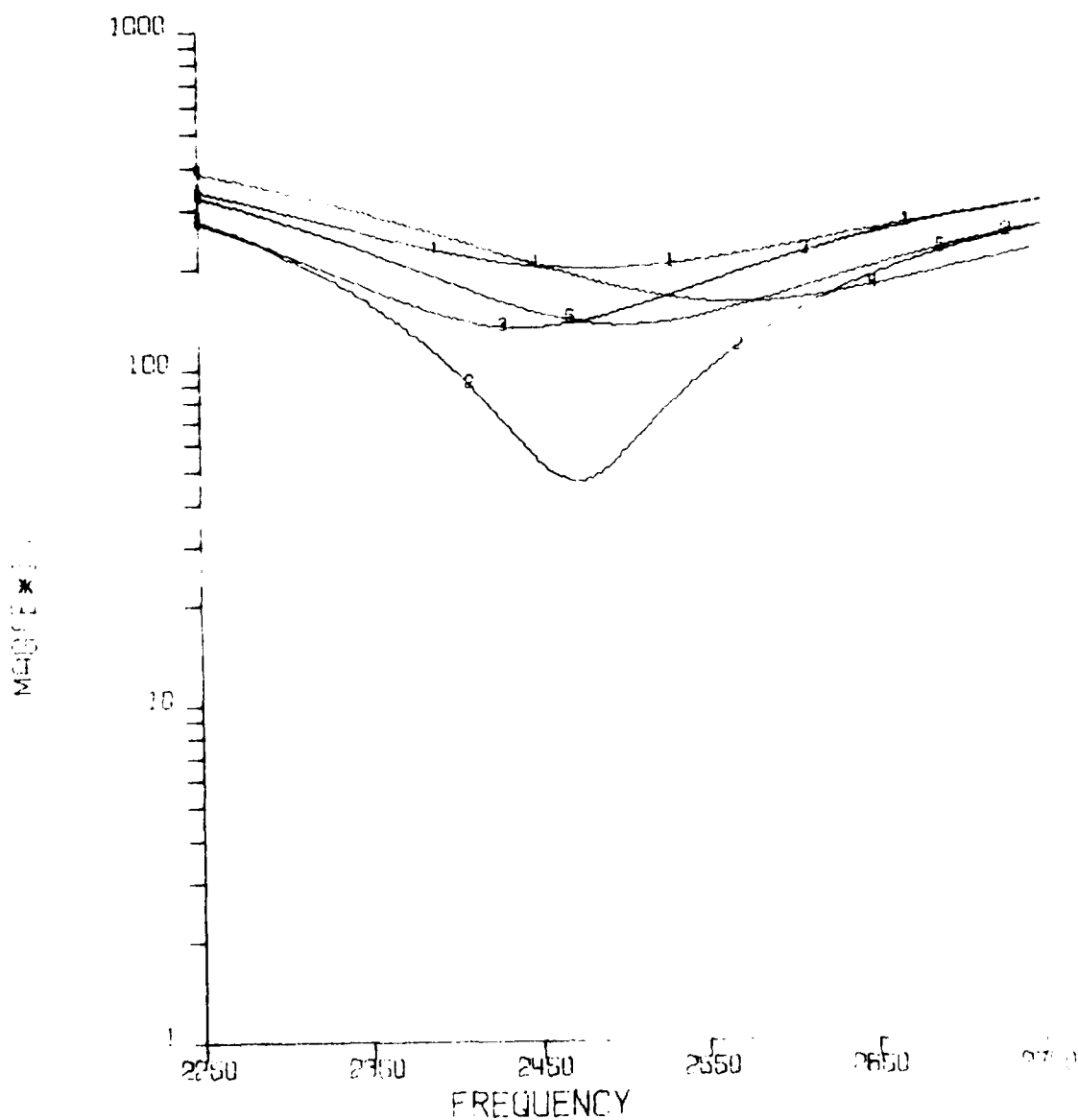
TR6 DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4155 QP=E+50



MAG(T*1) VERSUS FREQUENCY

CURVE 1 - MAX PR $3.70694046E04 + J7.66828215E04$
 CURVE 2 - MIN R $3.48842781E03 + J7.81806304E03$
 CURVE 3 - MAX X $3.43145191E04 + J7.70014372E04$
 CURVE 4 - MIN X $3.80512498E03 + J6.91990765E03$
 CURVE 5 - AVG $2.81596841E04 + J4.83015054E04$

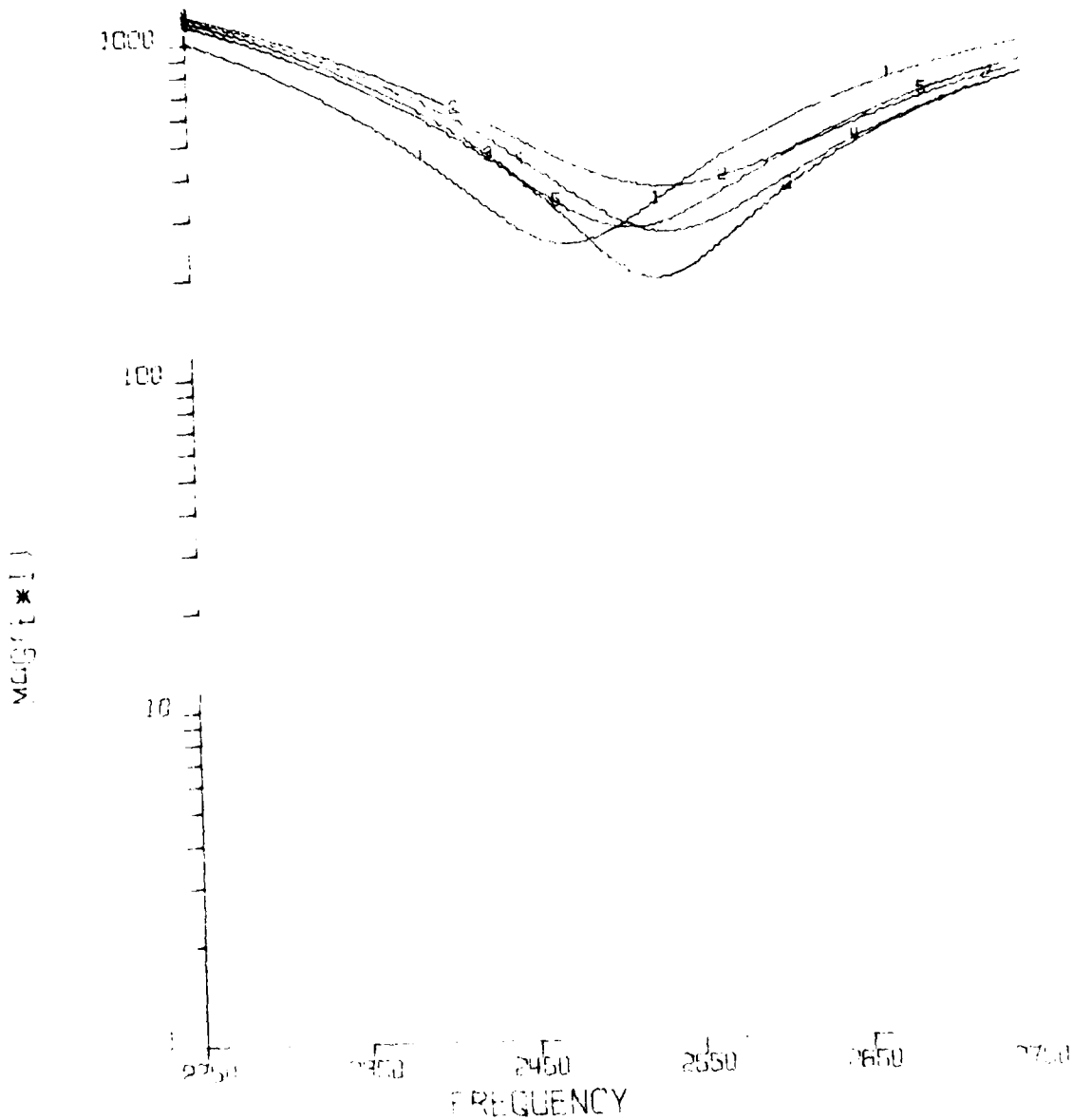
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4155 QP=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.61847804E04+J6.64038697E03
 CURVE 2 - MIN R =3.66139341E03+J7.66241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.06836049E04
 CURVE 4 - MIN X =1.28174594E04+J9.95386351E03
 CURVE 5 - AVG =1.09357651E04+J4.93621119E03

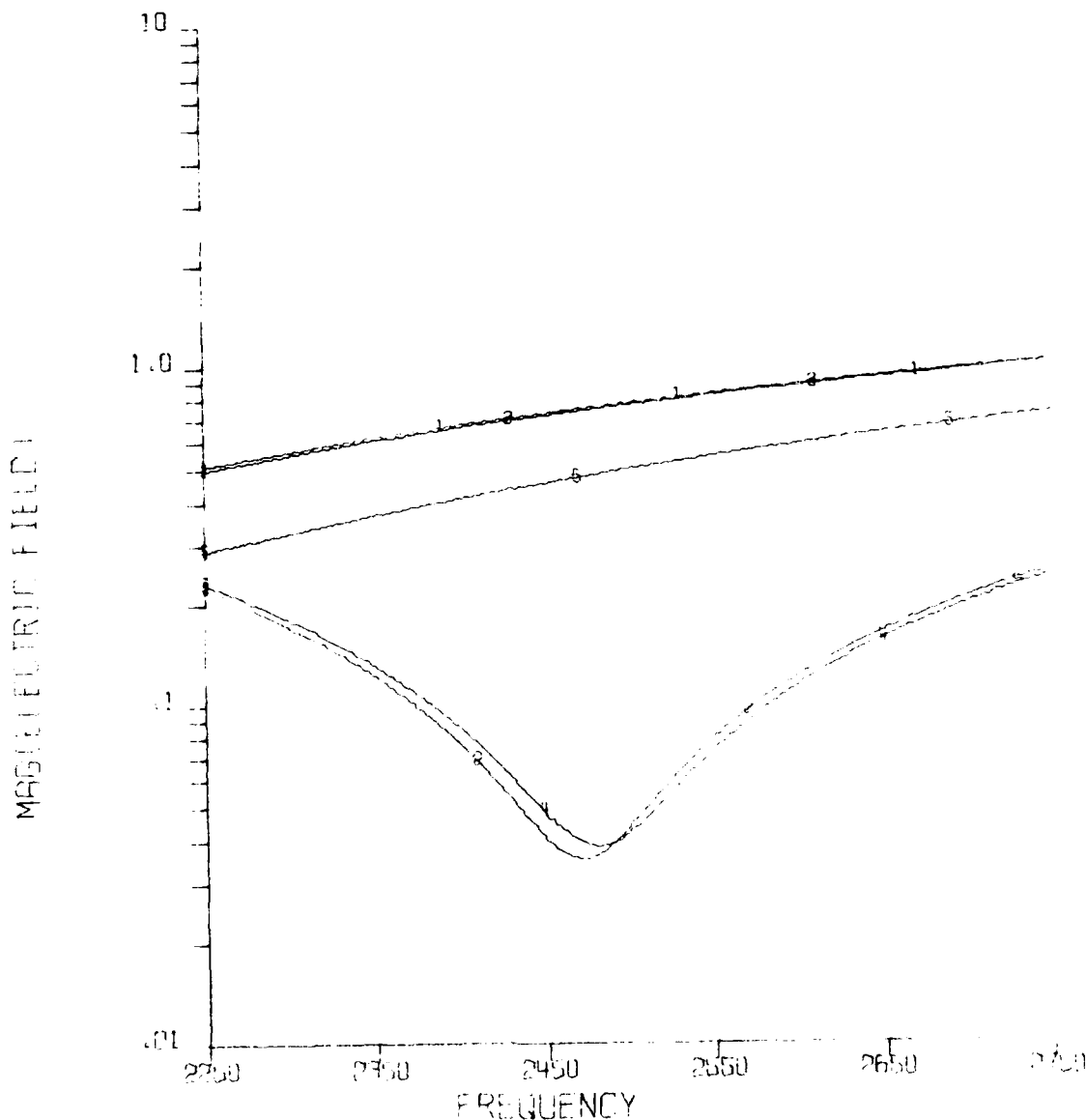
TRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADCAST (0.90)
 LP=.4155 GP=E+50



MAG(E*1) VERSUS FREQUENCY

CURVE 1	-	MAX	PR	5.508E1644E03+J7.43463019E03
CURVE 2	-	MAX	R	-8.19815967E03+J1.90784574E03
CURVE 3	-	MIN	R	-4.27851865E03+J2.38239074E03
CURVE 4	-	MIN	X	-5.24411695E03+J1.82753316E03
CURVE 5	-	MIN	X	-6.14926811E03+J3.21425445E03

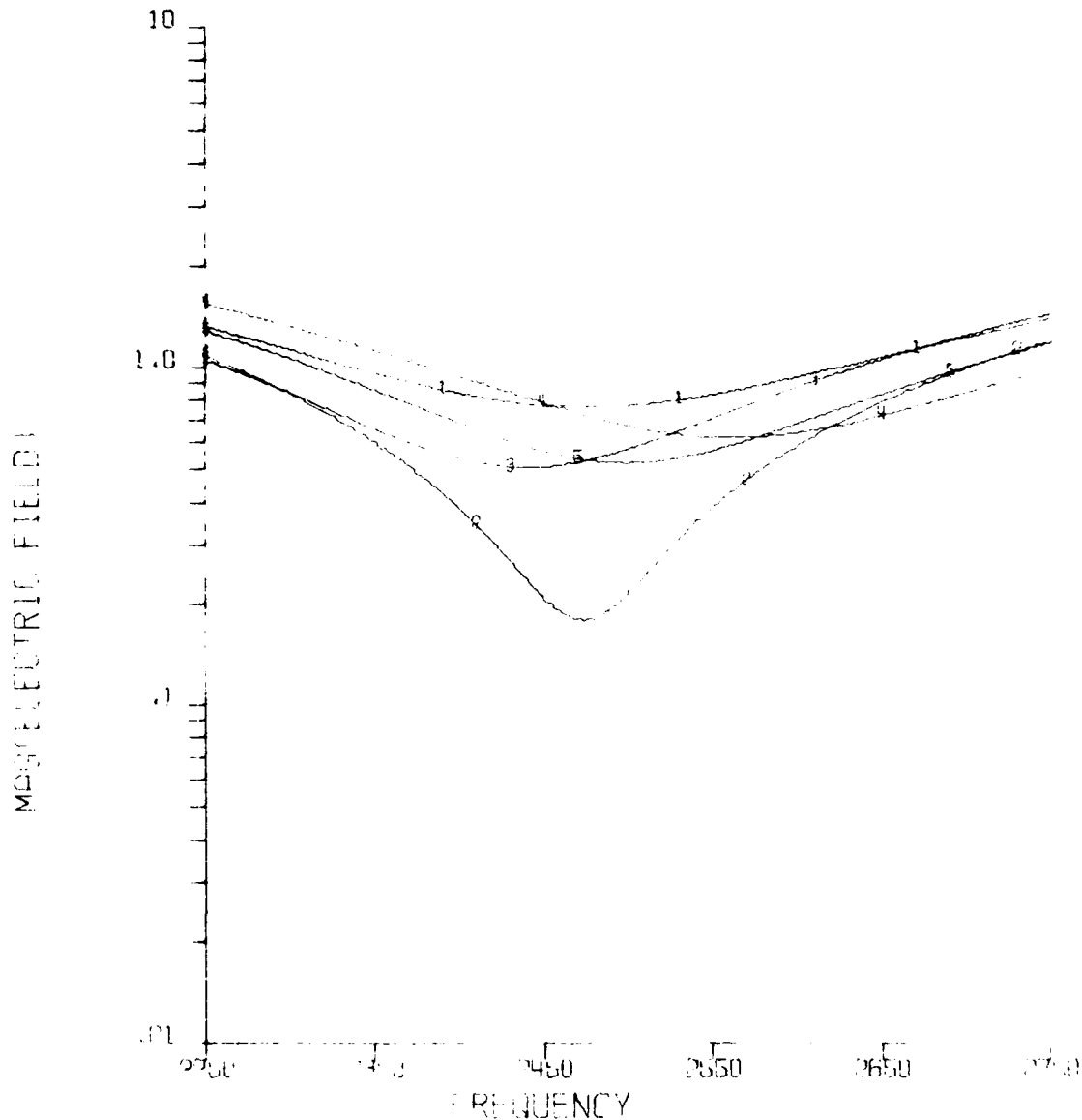
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.5)
 LP=.4155 GP=E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842381E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014232E04
 CURVE 4 - MIN X =3.80512498E03+J6.81990765E03
 CURVE 5 - G.P. =2.21596941E04+J4.83015054E04

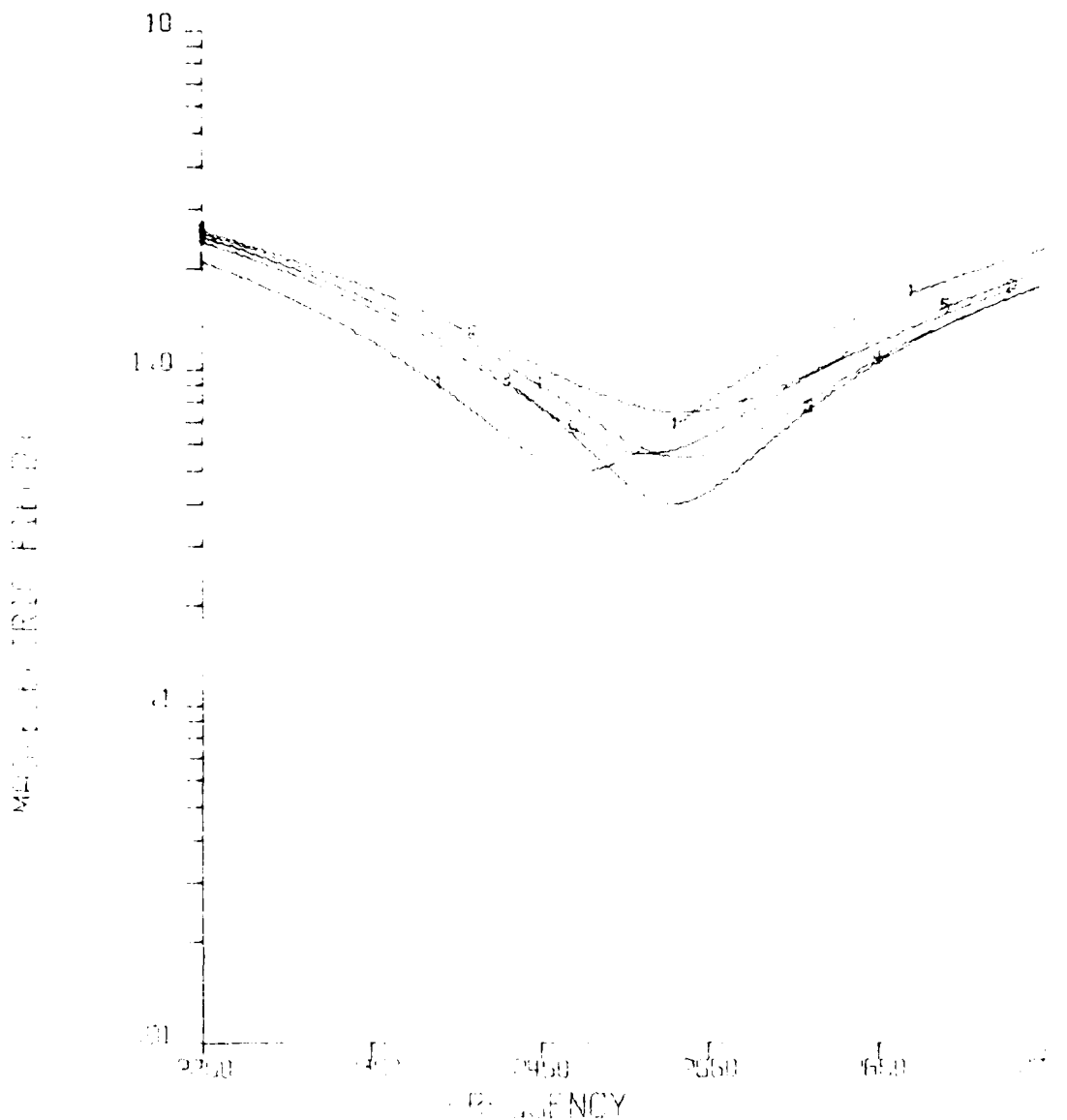
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4155 QP=E+50



MAG/ELECTRIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PR $1.61847804E04 + J6.64038697E03$
 CURVE 2 - MIN R $1.66139311E03 + J7.66241486E02$
 CURVE 3 - MAX X $1.07609138E04 + J1.06836949E04$
 CURVE 4 - MIN X $-1.78174594E04 - J9.35386371E02$
 CURVE 5 - A.C. $1.09367651E04 + J4.0781119E03$

TRG DUMILQAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (G, 9G)
 LP=.4155 GP=E+50



MAINTENANCE DATA VERIFIED FREQUENCY

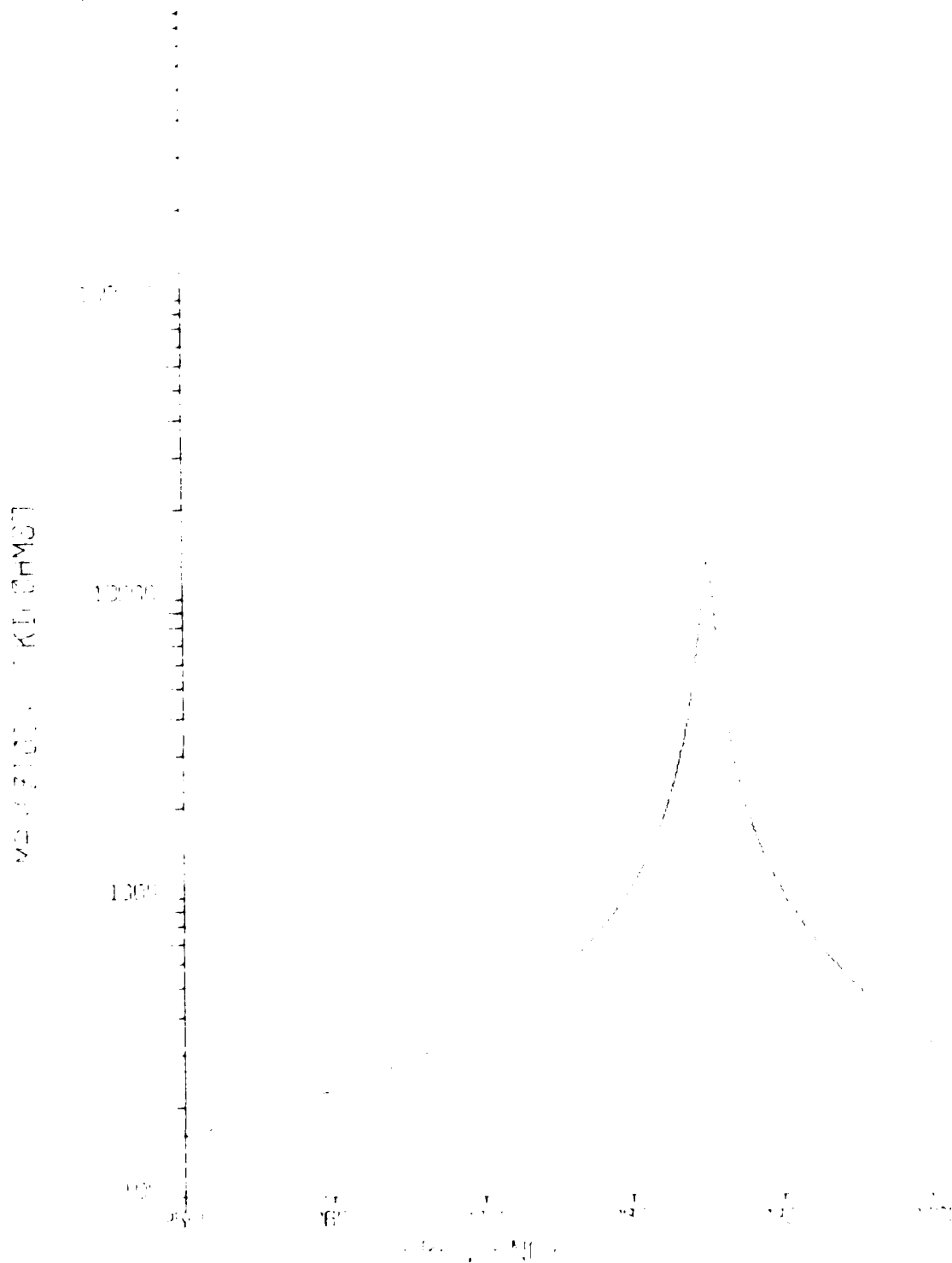
CURVE 1	MAX P	5.50831644E+00	17.3466115E+00
CURVE 1	MAX P	9.1871586E+00	17.704744E+00
CURVE 2	MIN P	4.33351865E+00	17.3466115E+00
CURVE 4	MIN X	1.744118E+00	17.815E+00
MIN	MIN	1.1216011E+00	17.814E+00

TRACOR, INC.

HIGH BAND

IRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND

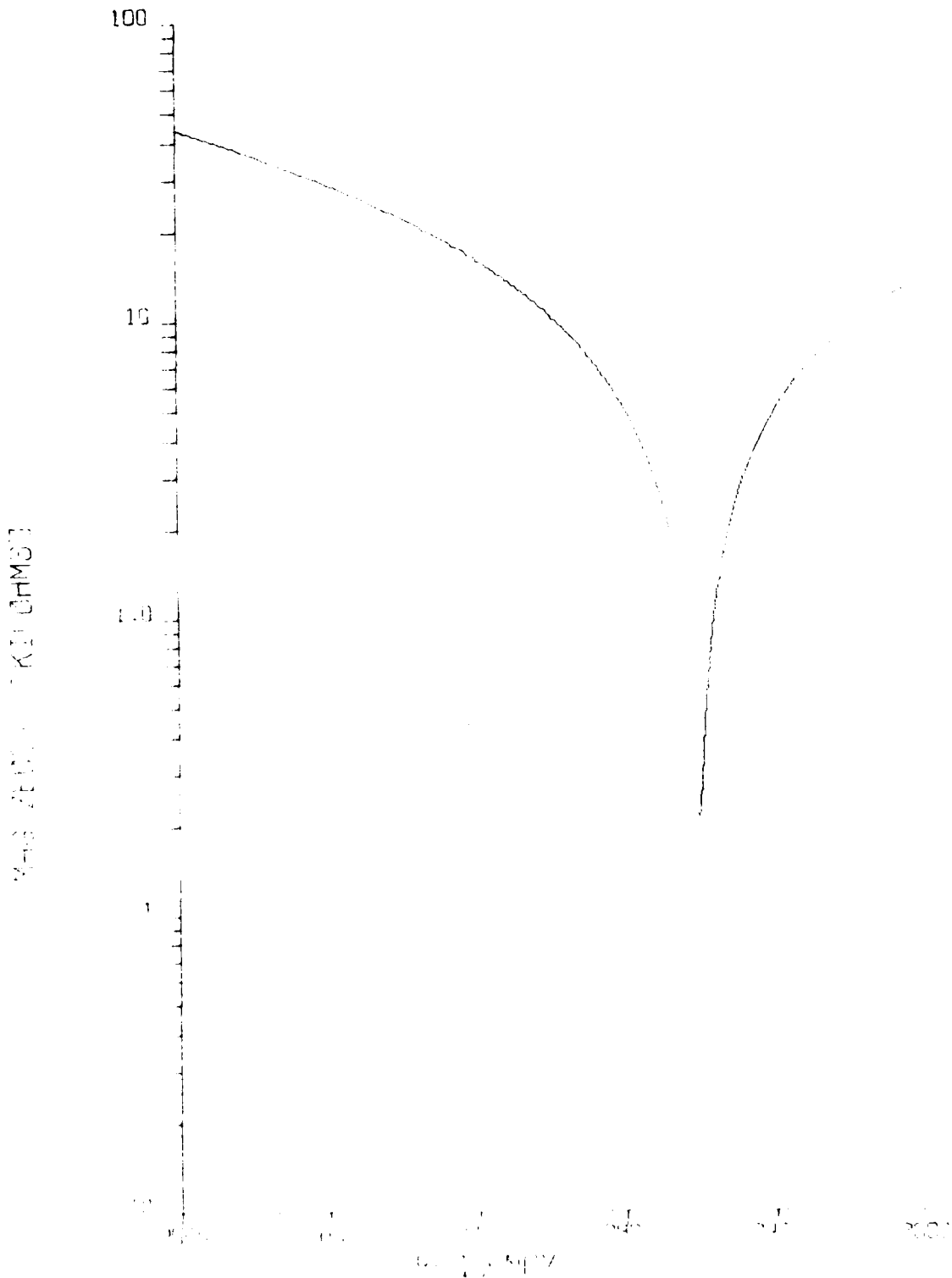
QPE-50 CS=.1949E-7 DS=C



MEASUREMENT IN KILOHERTZ

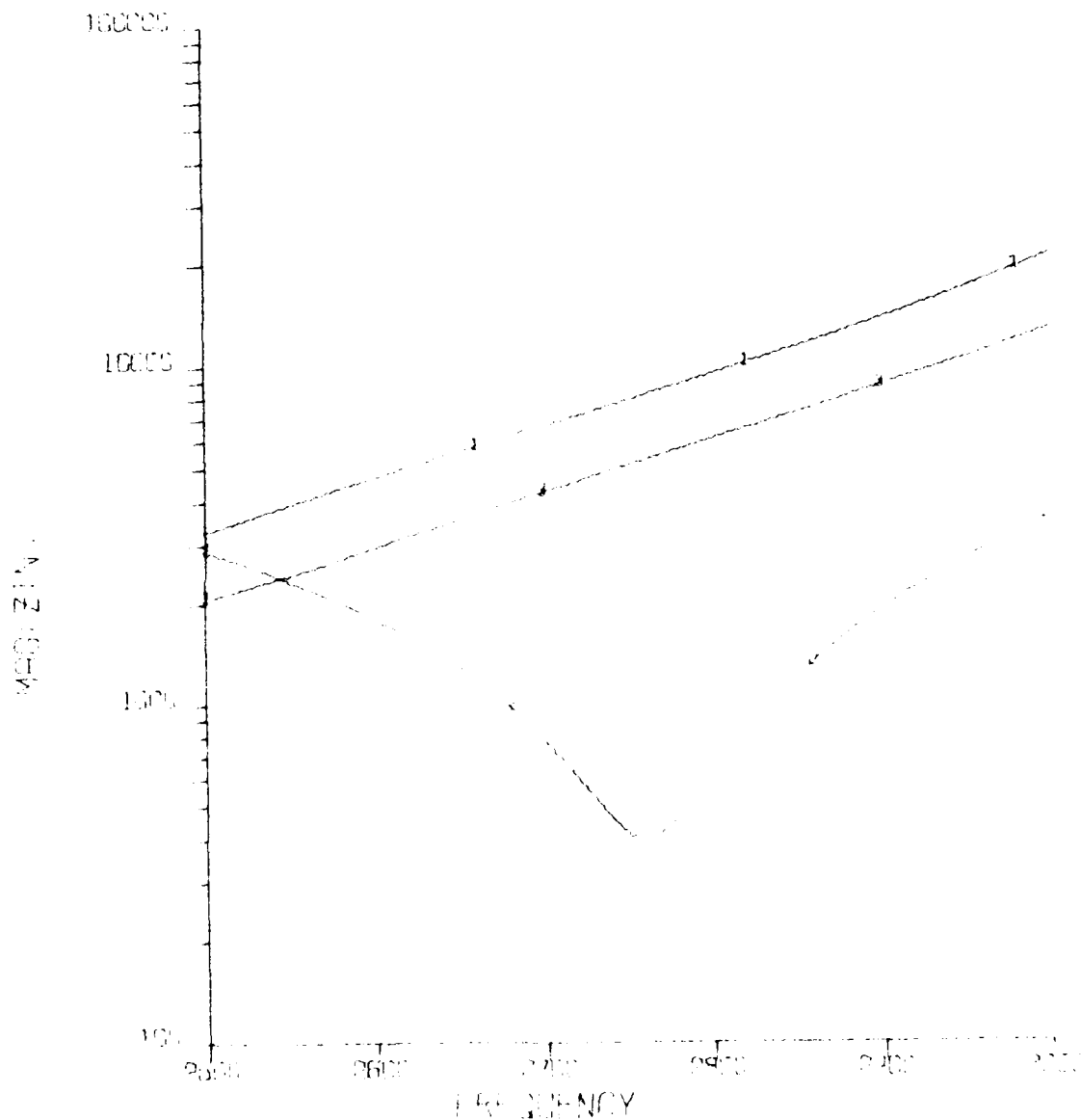
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND

LP=.3013 CP=E+60 CS=.1949E-7 DS=0



MEASURED IN A VACUUM TUBE

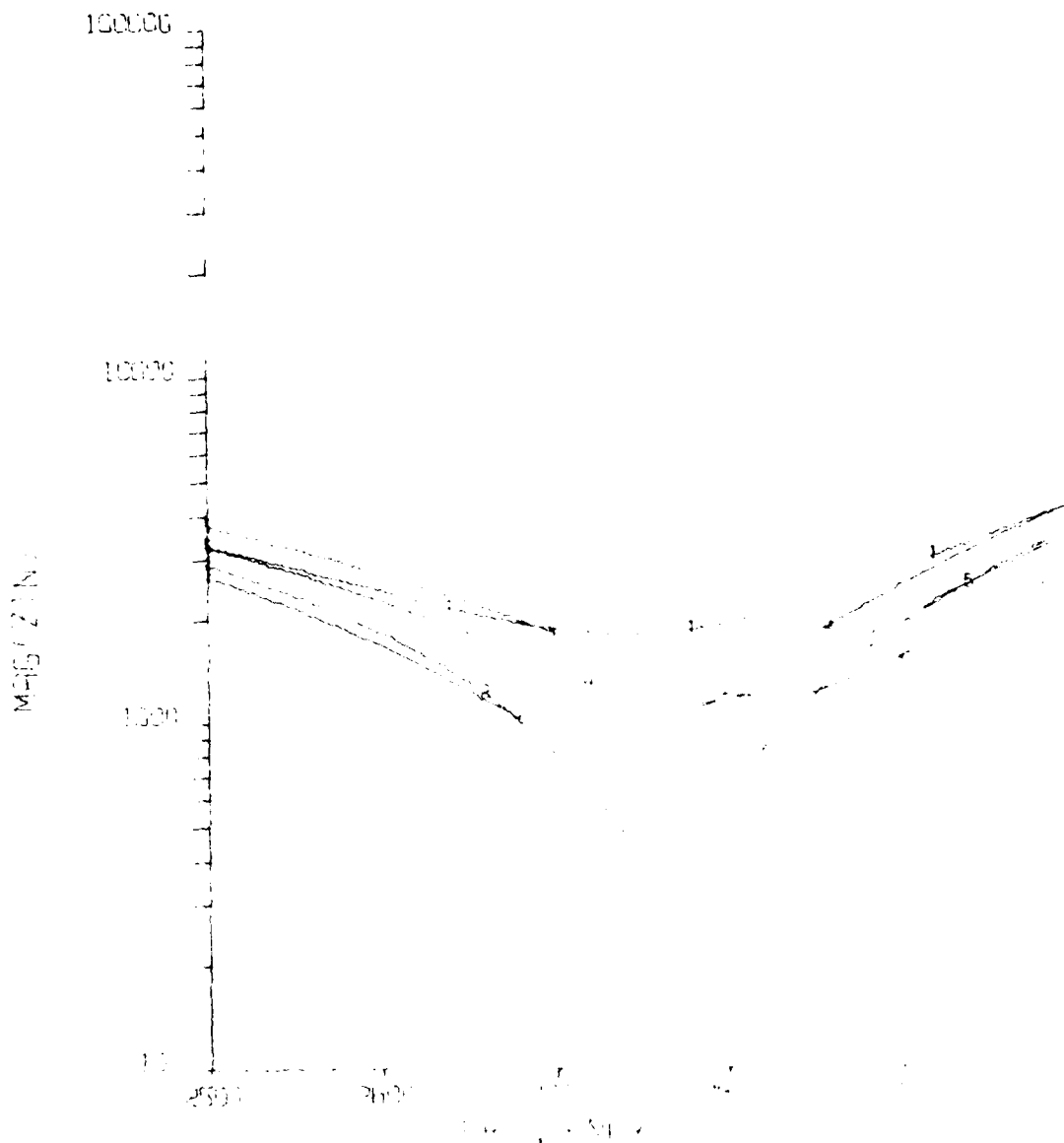
TR- DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 IP=.3013 QP=E+60 CS=.1949E-7 DS=0



MEAN ZIN. VERSUS FREQUENCY

CURVE 1 MAX. PP. 1.4E+04 1.0E+04+0.1E+04
 CURVE 2 MIN. R 1.0E+04 1.0E+04+0.1E+04
 CURVE 3 AVE. 1.0E+04 1.0E+04+0.1E+04

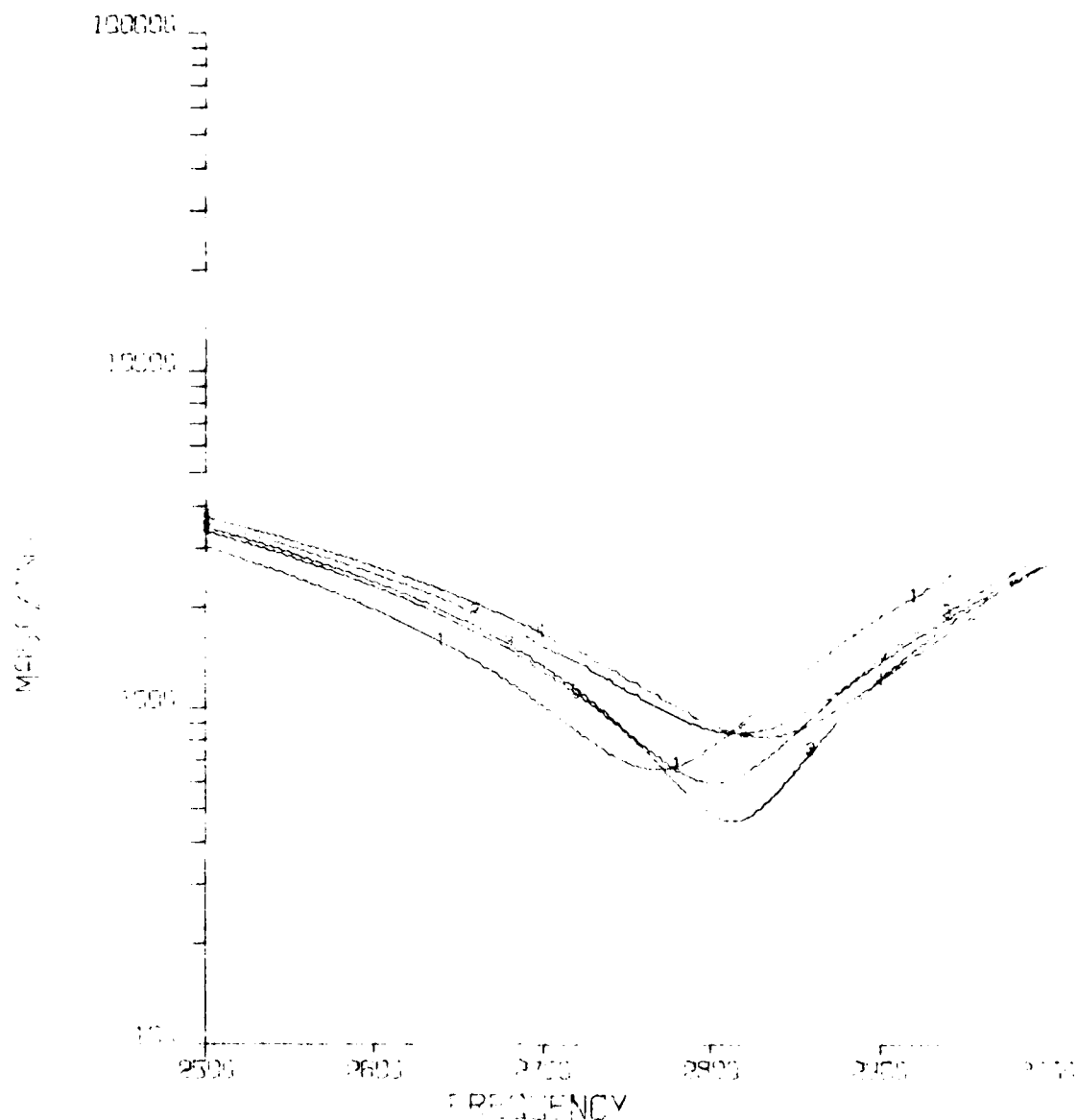
TRC DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0,30)
 LP=.3013 CP=+50 CS=.1949E-7 DS=0



MAGNITUDE (MIN, MAX, MIN, MAX)

PARAMETER	MIN P	MAX P	MIN X	MAX X
CP=+50	1.5E+01	1.5E+01	1.5E+01	1.5E+01
CP=+50	1.5E+01	1.5E+01	1.5E+01	1.5E+01
CP=+50	1.5E+01	1.5E+01	1.5E+01	1.5E+01
CP=+50	1.5E+01	1.5E+01	1.5E+01	1.5E+01
CP=+50	1.5E+01	1.5E+01	1.5E+01	1.5E+01

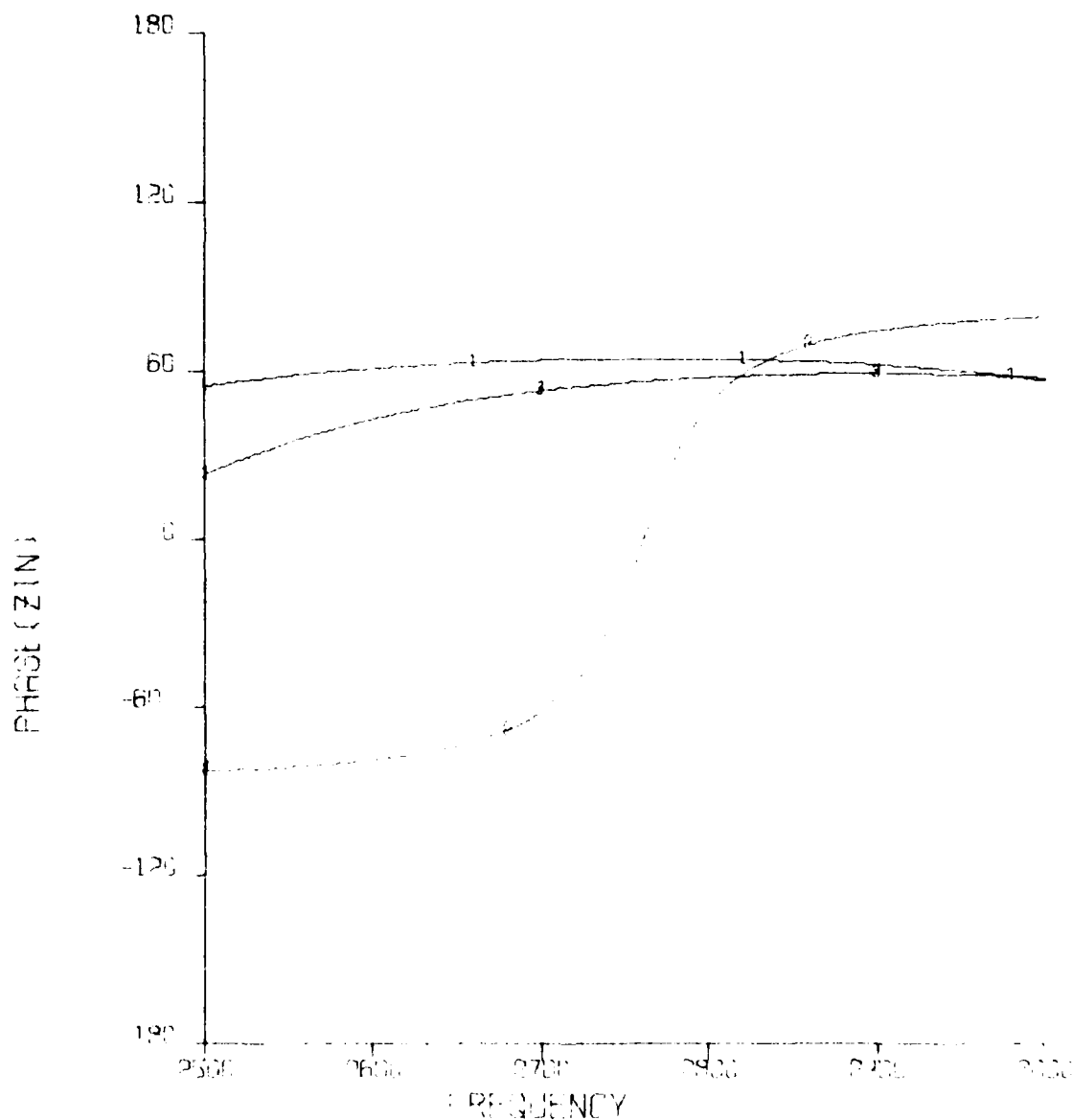
TRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3013 GP=+50 CS=.1949E-7 DS=0



MAGZ (Y) VERSUS FREQUENCY

CURVE 1 = MAX PPI 6.5 85226748E03+J8.12201916E03
 CURVE 2 = MAX P 2.74807440E03+J2.79095706E03
 CURVE 3 = MIN P 2.70836521E03+J2.64525495E03
 CURVE 4 = MIN X 6.22634102E03+J1.41023403E03
 CURVE 5 = AVG 5.02953123E03+J4.58000000E03

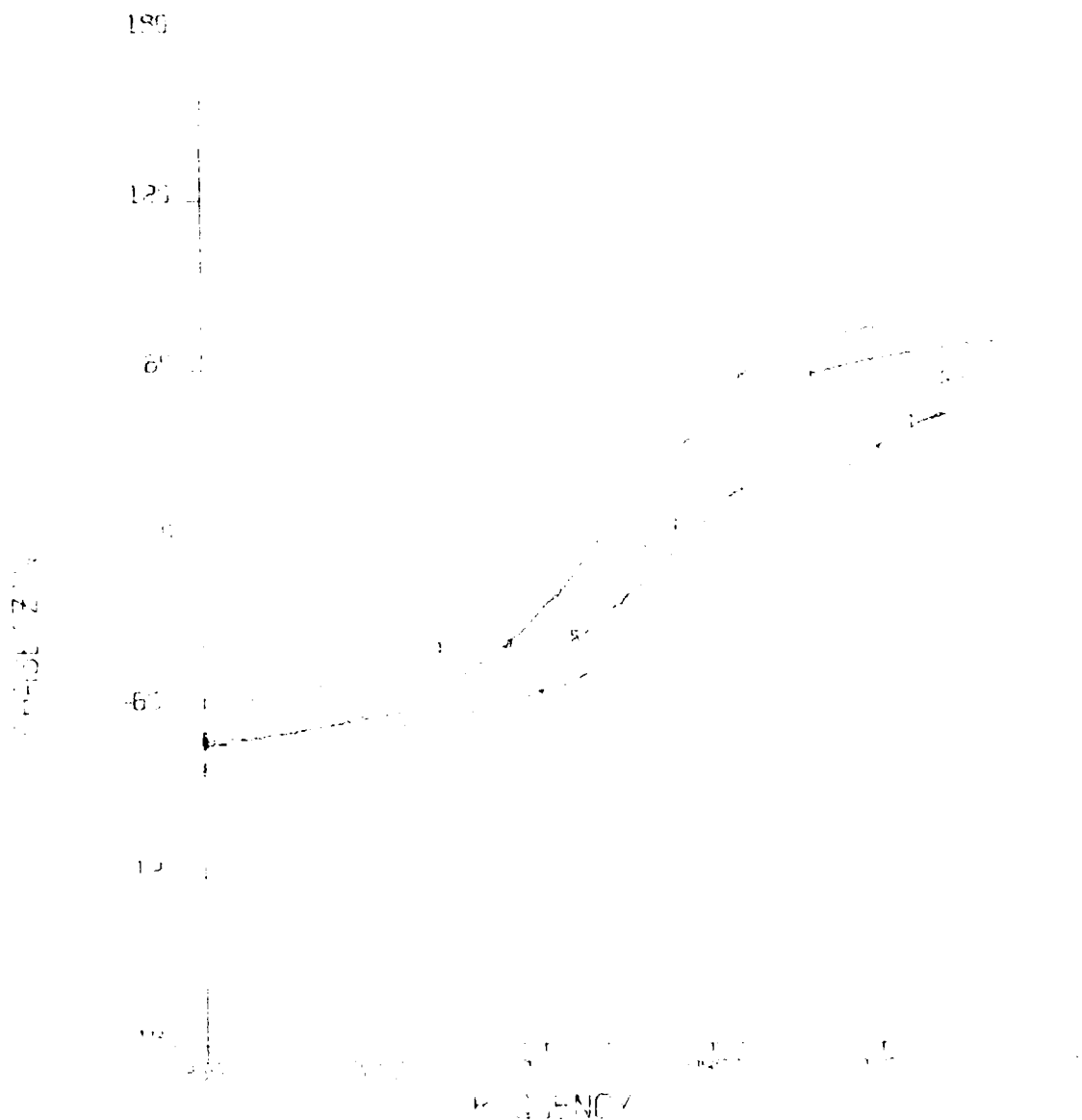
TRG DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (G,C)
 LP=.3013 QP=E+50 CS=.1949E-7 DS=0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 = MAX. PR. 4.63770761E04+J2.1950397E-04
 CURVE 2 = MIN. PR. 3.550169917E03+J9.2913E-05
 CURVE 3 = AVG. 2.2506599E04+J5.75791665E-04

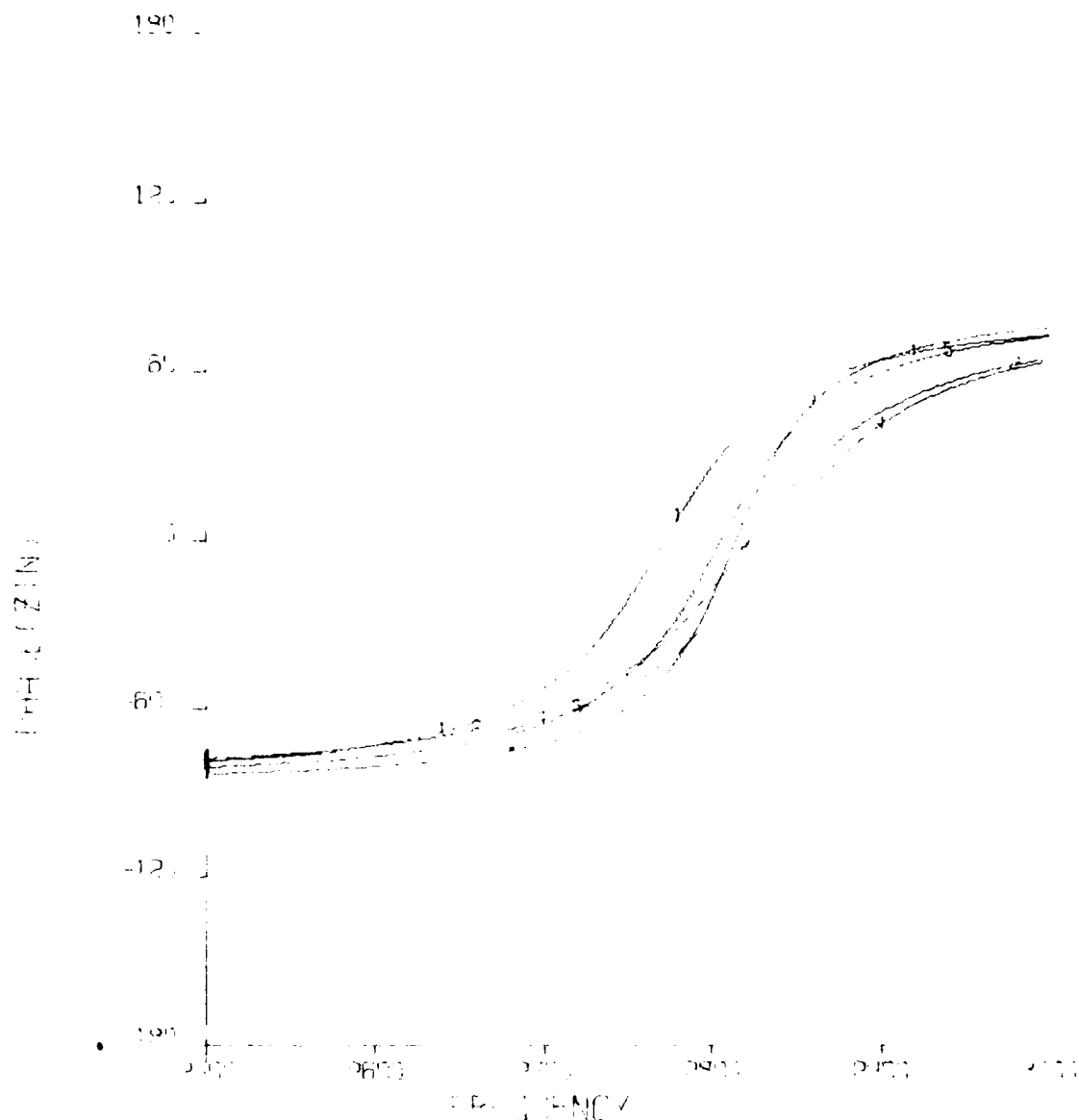
TPG PPMIL SPD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (C.P. 1)
 (P. 13012) (P. 450) (S. 1919) (P. 1905)



ANGLE IN DEGREES VERSUS FREQUENCY

C.P. 1	MAX. P	1.185 (1.185) (1.185) (1.185) (1.185)
C.P. 1	MIN. P	1.185 (1.185) (1.185) (1.185) (1.185)
C.P. 1	MAX. X	1.185 (1.185) (1.185) (1.185) (1.185)
C.P. 1	MIN. X	1.185 (1.185) (1.185) (1.185) (1.185)
C.P. 1	P	1.185 (1.185) (1.185) (1.185) (1.185)

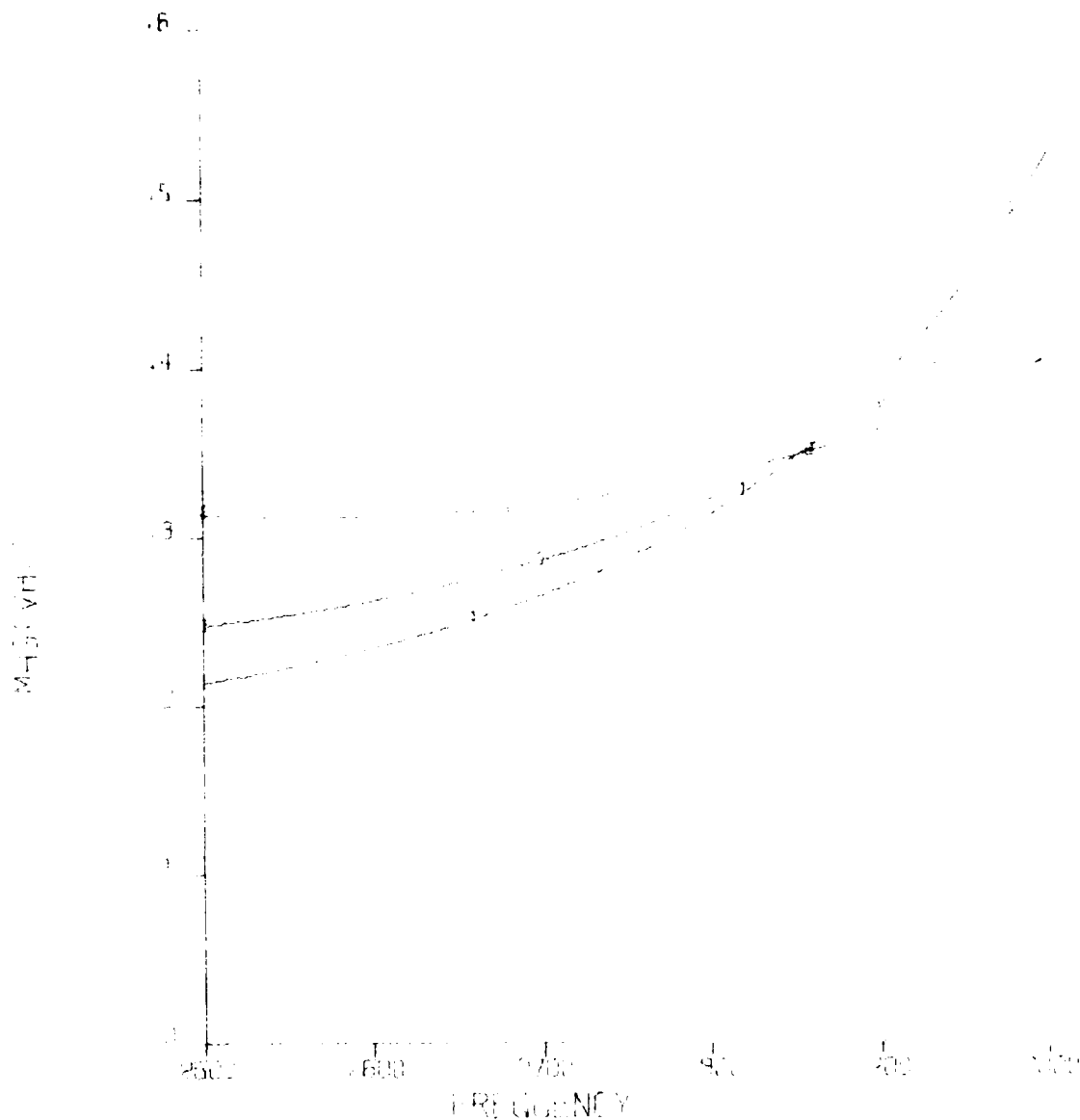
TRO DUMILGAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (C.90)
 LP-3013 QP-450 CS-10405-7 DS-0



PHASE (ZIN) VER 003 FRE 2 ANAL 7

Q.P. 1	MCV P	10.194124	10.1731016	10
Q.P. 2	MCV P	10.194124	10.1731016	10
Q.P. 3	MIN P	10.194124	10.1731016	10
Q.P. 4	MIN Y	10.194124	10.1731016	10
Q.P. 5	MIN	10.194124	10.1731016	10

TRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.3013 GP=1E+60 CS=-1840L-7 PG=0

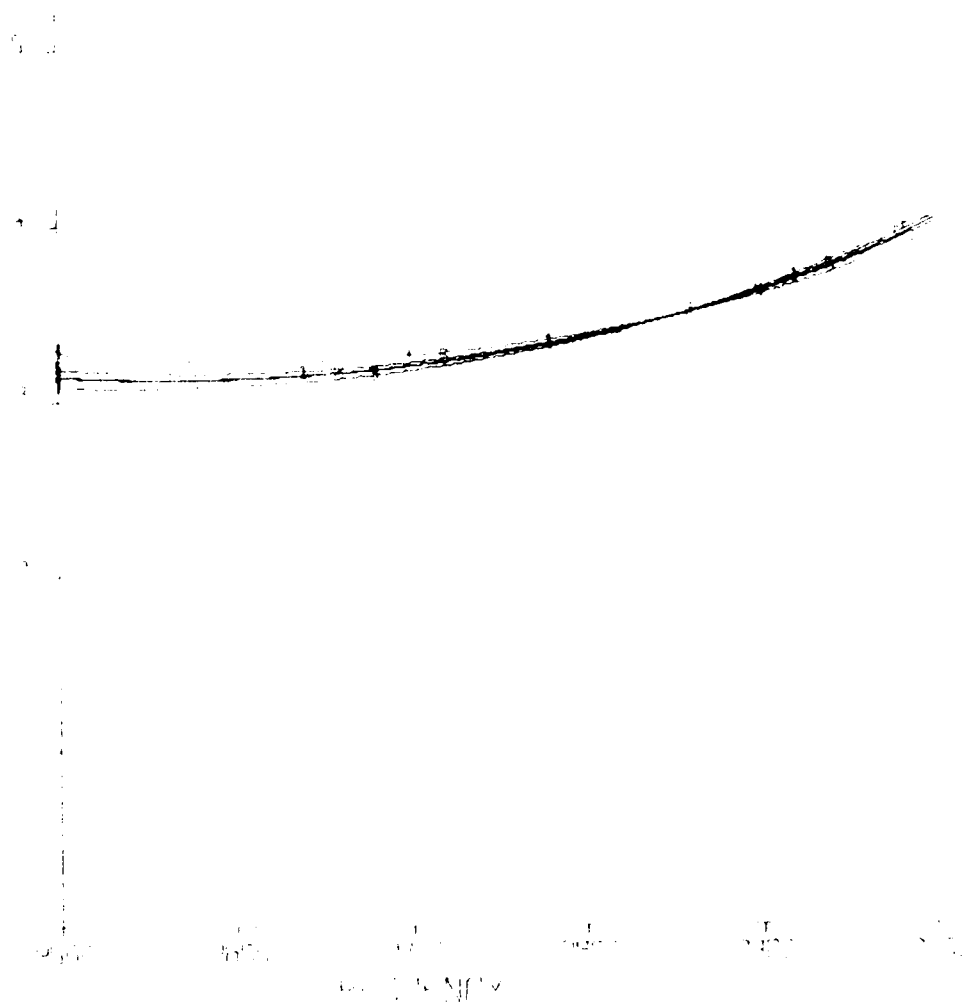


MAGNITUDE (DB) VERSUS FREQUENCY

CURVE 1	MAX POWER (DB) 0.45
CURVE 2	MIN POWER (DB) 0.12
CURVE 3	AVG POWER (DB) 0.28

TRG DUMILBAP I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.22)
 L.P. 3212 C.P. 1553 (S. 1949) 7 18=0

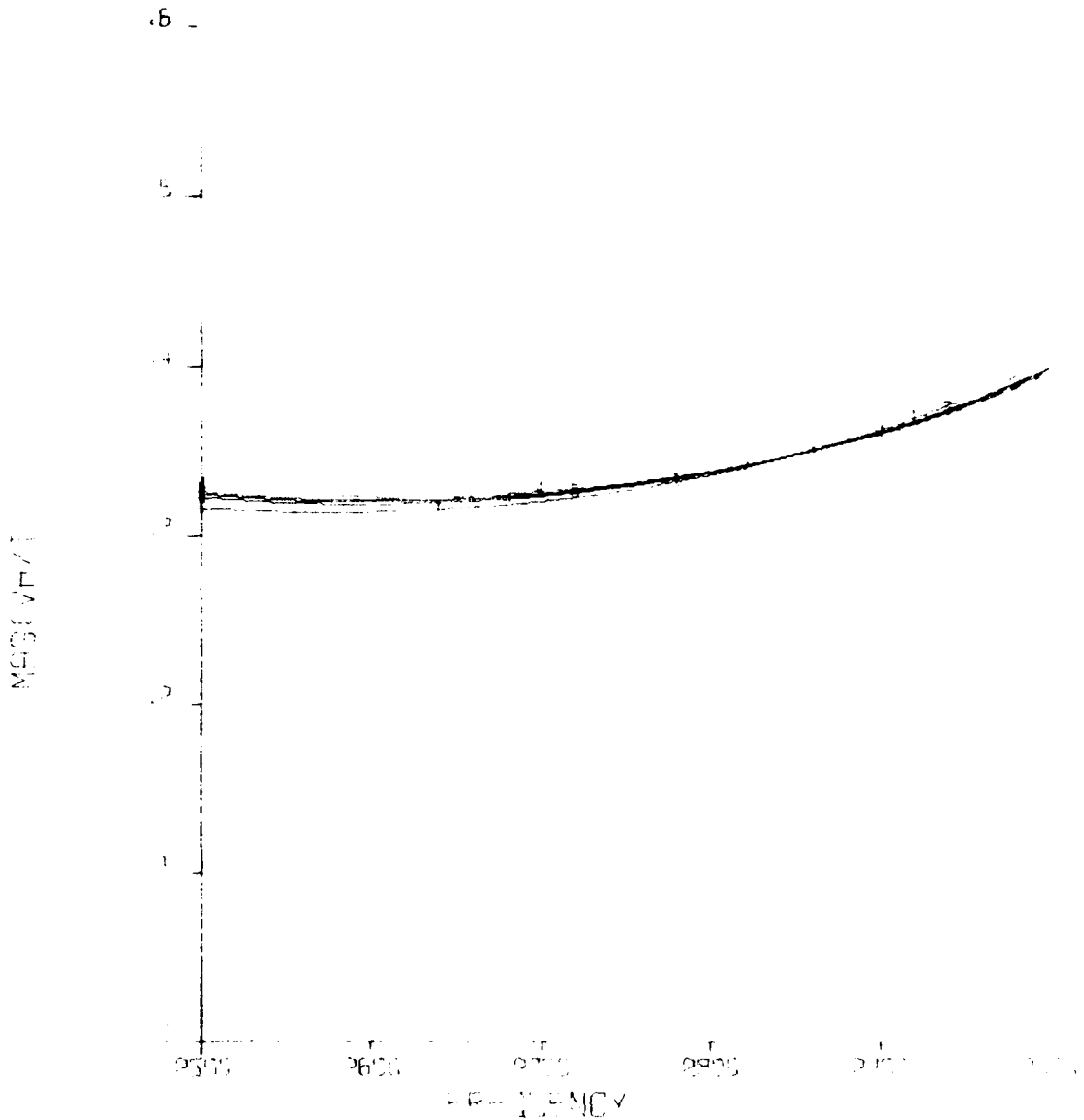
6



MEASUREMENTS MADE BY J. R. NELSON

C.P. 1	MEAS. UP	1.662 10 417 144 19.1 1999 140 17
C.P. 1	MEAS. D	1.662 10 417 144 19.1 1999 140 17
C.P. 1	MEAS. X	1.662 10 417 144 19.1 1999 140 17
C.P. 1	MEAS. Y	1.662 10 417 144 19.1 1999 140 17
C.P. 1	MEAS. Z	1.662 10 417 144 19.1 1999 140 17

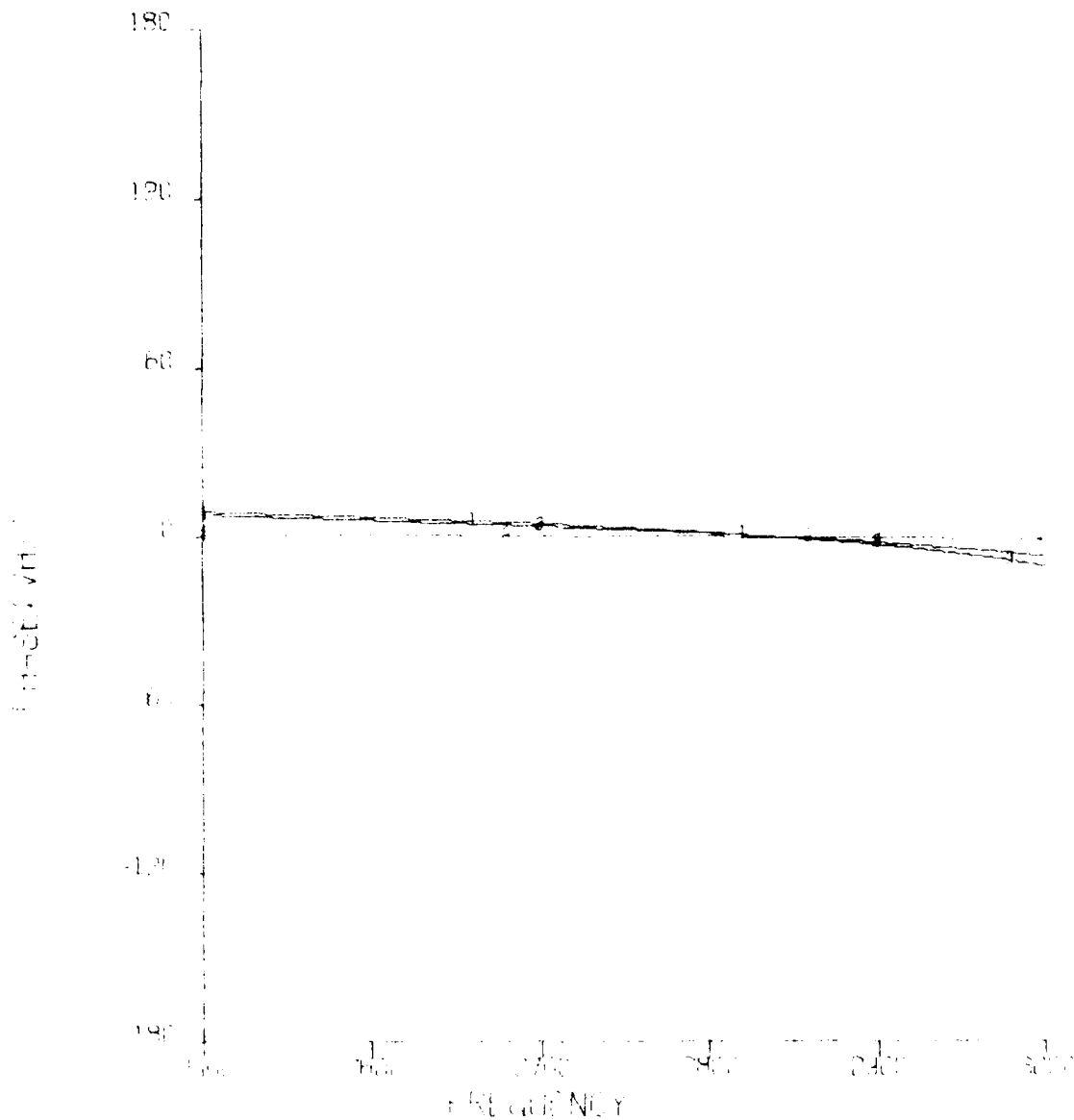
TRG DUMIL 3AD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE 10,500
 LPE=.3012 CPLE=50 CSE=.19495 10,500



MAG (V/F) VERSUS FREQ (MC)

CLPSE 1 - MAX PP-5 5.000000000000 12.1211016-10
 CLPSE 1 - MAX P 1.000000000000 12.1211016-10
 CLPSE 1 - MIN P 0.000000000000 12.1211016-10
 CLPSE 1 - MIN X 0.000000000000 12.1211016-10
 CLPSE 1 - PLE 0.000000000000 12.1211016-10

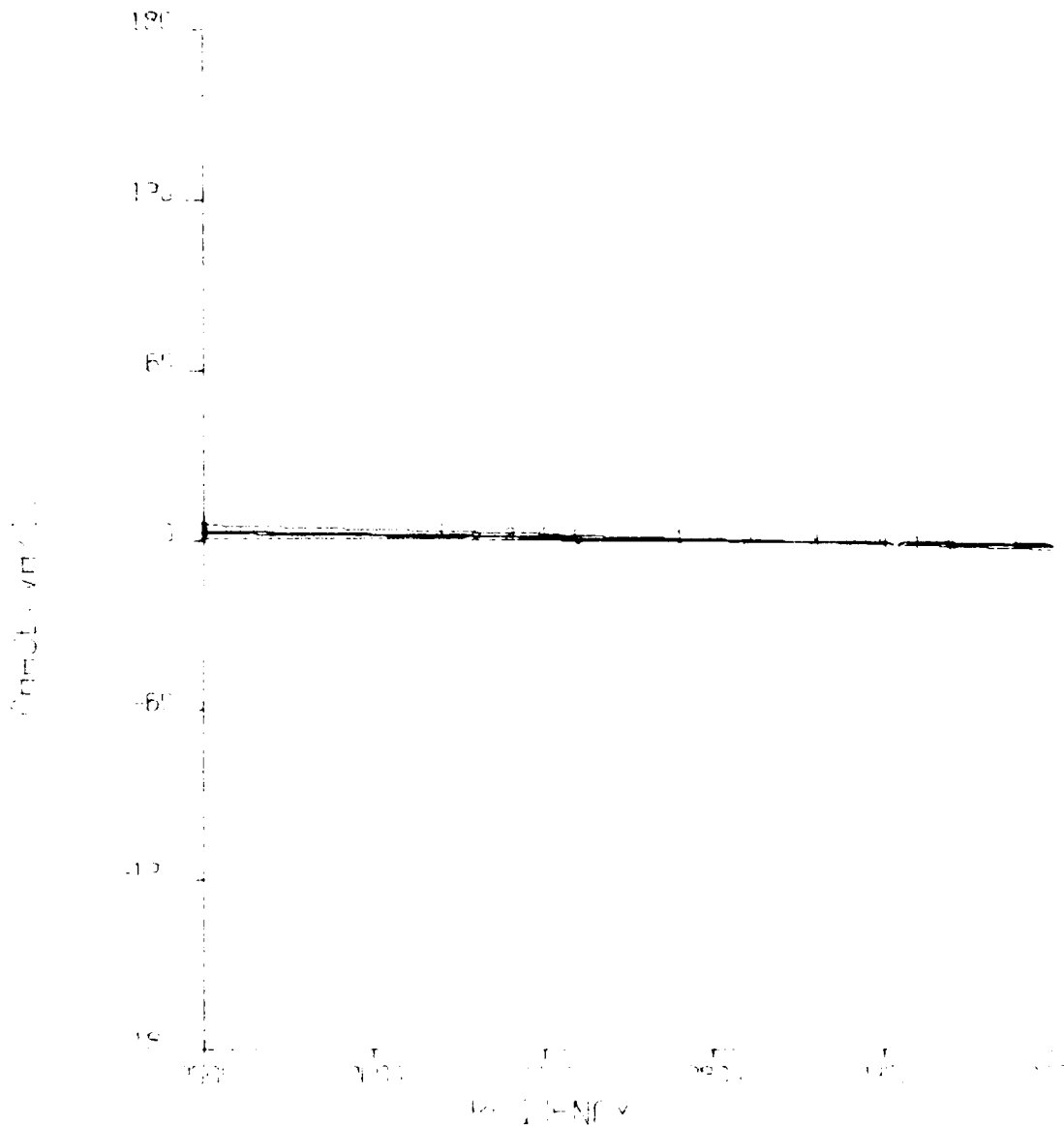
TRG DUMILCAD I
 CAP. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.3013 DP=E+50 CS=.1849E-7 DS=0



DATA POINTS FOR FREQUENCY

CURVE 1	MAX. FREQ	4.03E+03	1.0E+04	1.0E+04	1.0E+04
CURVE 1	MIN. FREQ	1.0E+00	1.0E+00	1.0E+00	1.0E+00
CURVE 2	MAX. FREQ	1.0E+00	1.0E+00	1.0E+00	1.0E+00

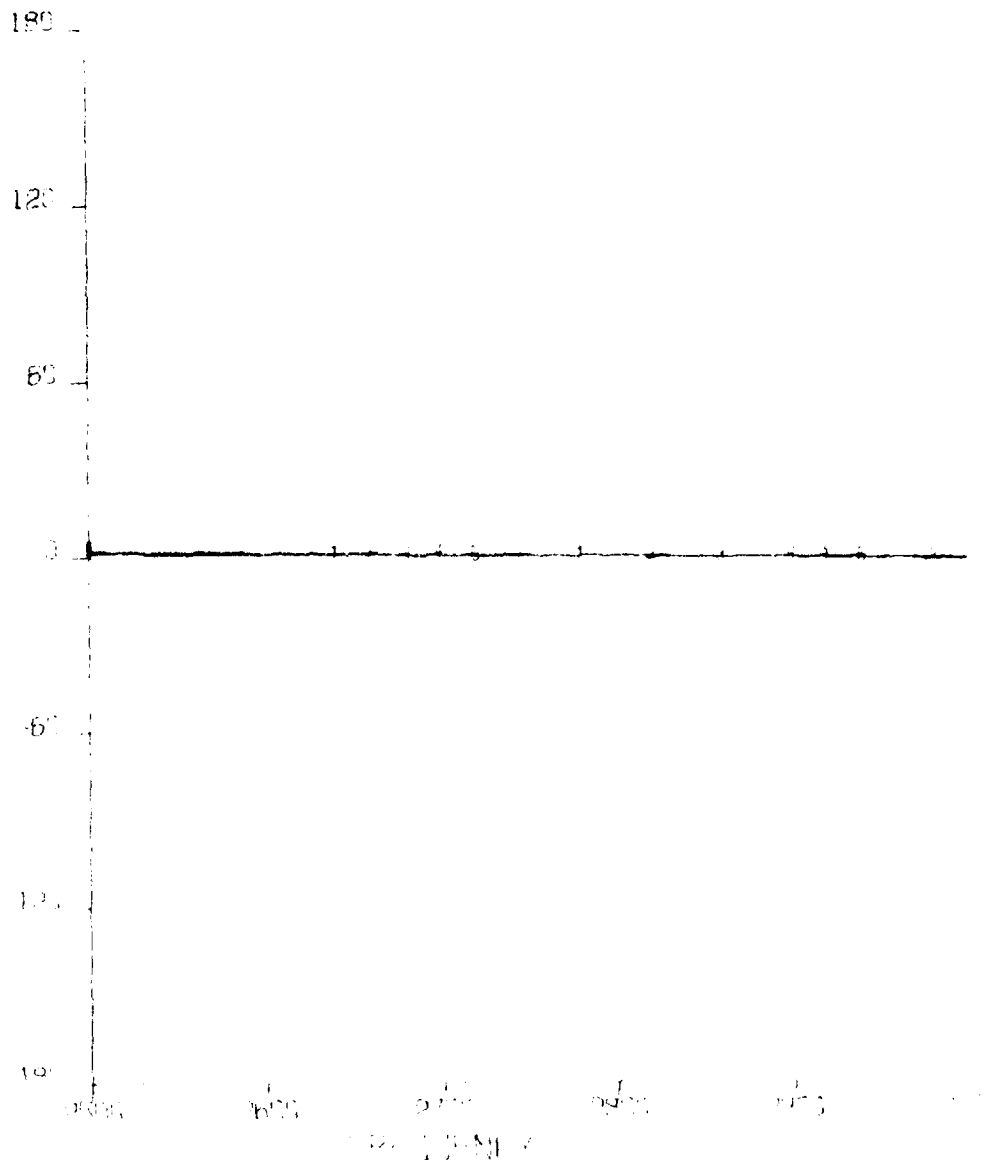
TRC DUMILCAP I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 50 DEGREE (C, 30)
 IP-3012 QP-50 CS-19495 2 5945



Page 1 of 1

[1] P. 1 1 M. V. 100 1.111.111.111 14 P. 1 1.111.111.111 14
 [2] P. 1 1 M. V. 100 1.111.111.111 14 P. 1 1.111.111.111 14
 [3] P. 1 1 M. V. 100 1.111.111.111 14 P. 1 1.111.111.111 14
 [4] P. 1 1 M. V. 100 1.111.111.111 14 P. 1 1.111.111.111 14
 [5] P. 1 1 M. V. 100 1.111.111.111 14 P. 1 1.111.111.111 14

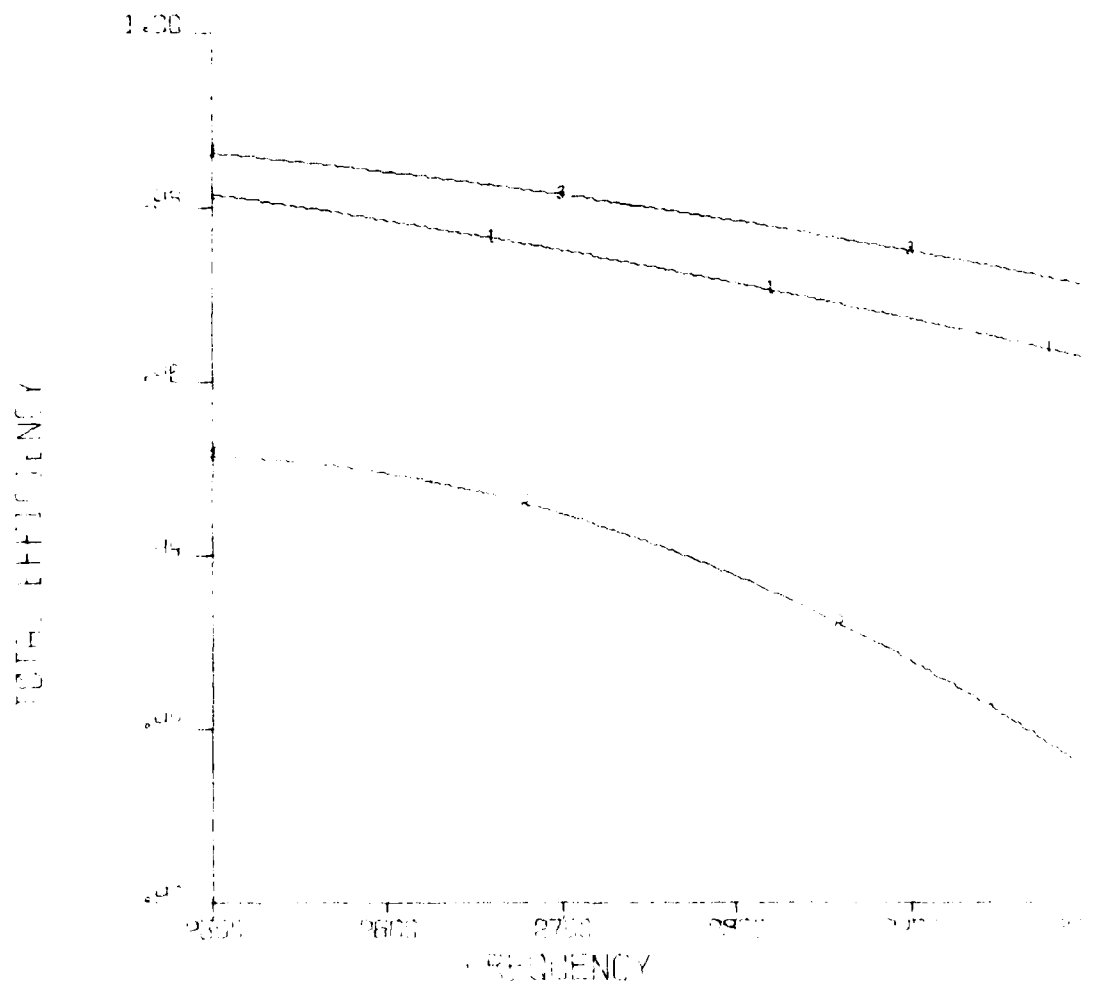
TRG CUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3013 GP=1.50 CS=.1949E-7 DS=0



PARAMETER VALUES AND UNITS

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 PARAMETER VALUES AND UNITS
 PARAMETER VALUES AND UNITS

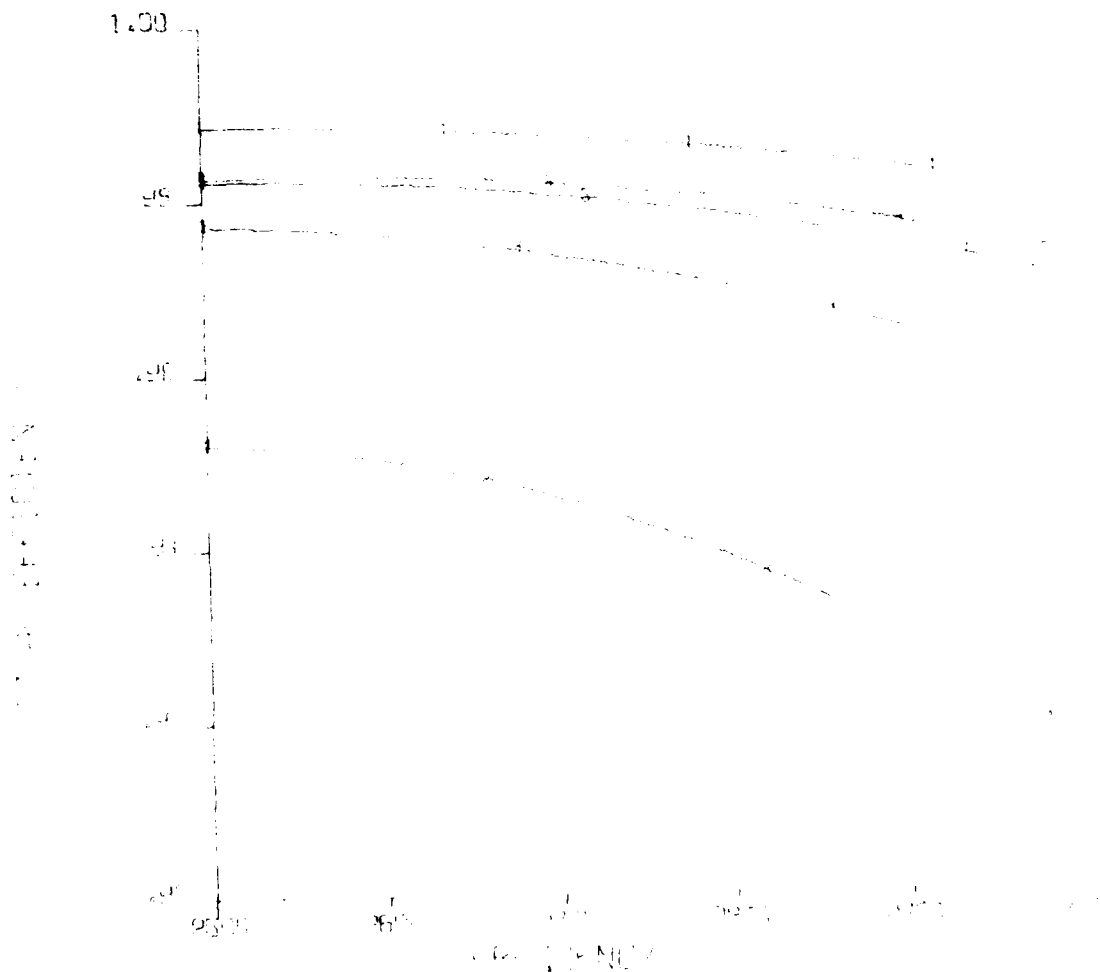
4



TOTAL EFFICIENCY MEASURES - 100% NOV

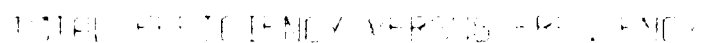
CIPR	1	MAX PR	31.13070761504438.1947750000000000
CIPR	2	MIN PR	3.6316890171034104.0200000000000000
CIPR	3	PR	3.15565044104435.0721685000000000

IR. 0.000000 I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE 10.001
 LP=1.3013 CP=1.50 CS=1.0405 2 10.000



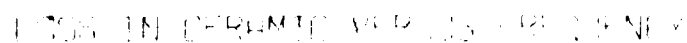
DATA 1 100% NEW 100% NEW 100% NEW 100% NEW
 (P.P.) 1 MAX. 100% 100% 100% 100%
 (P.P.) 1 MIN. 100% 100% 100% 100%
 (P.P.) 1 MAX. 100% 100% 100% 100%
 (P.P.) 1 MIN. 100% 100% 100% 100%
 (P.P.) 1 100% 100% 100% 100%

1.35 -



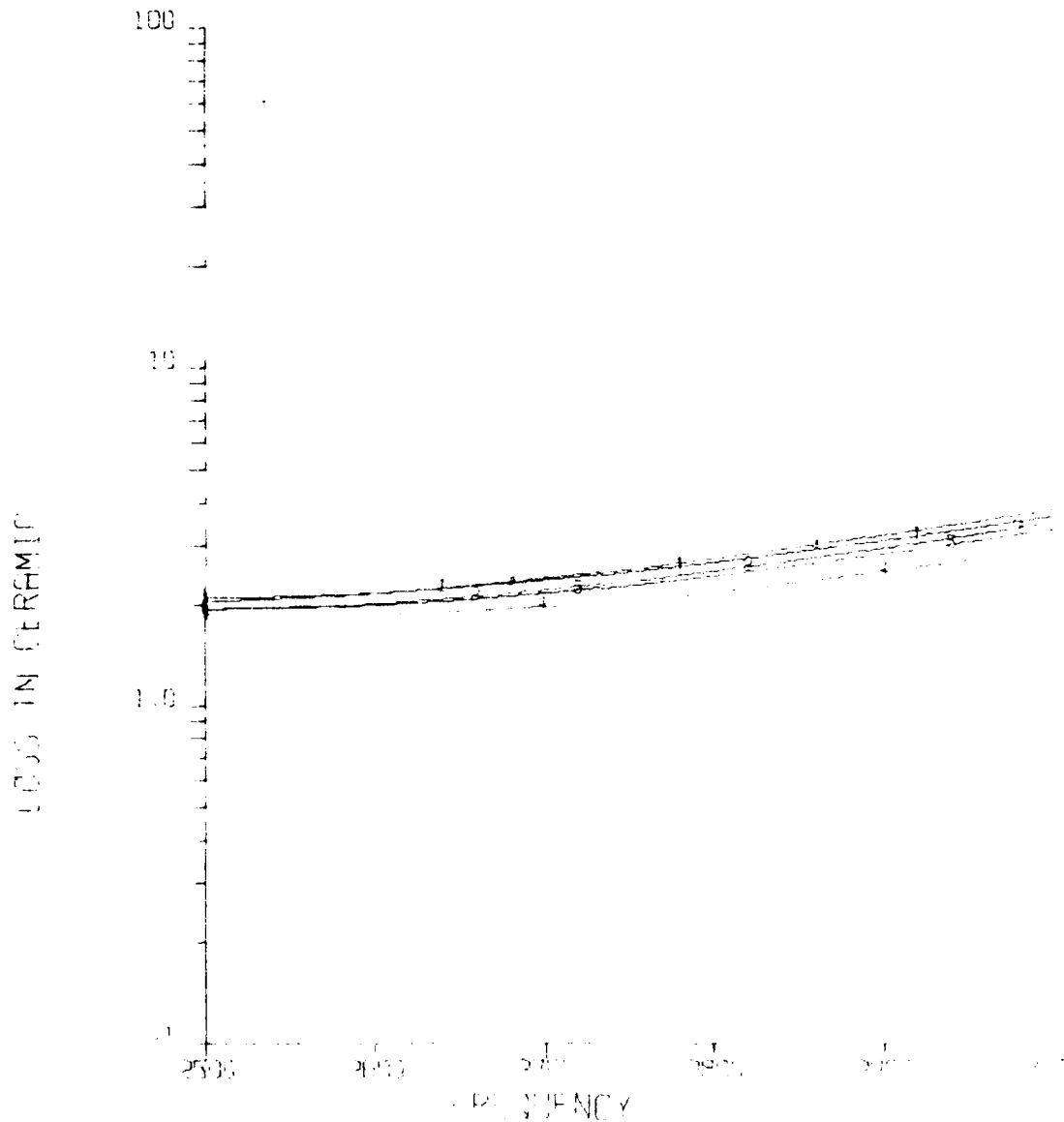
COPIES TO GO: 2400000

SECRET



MAILED TO K-H PAPER # 46 6213

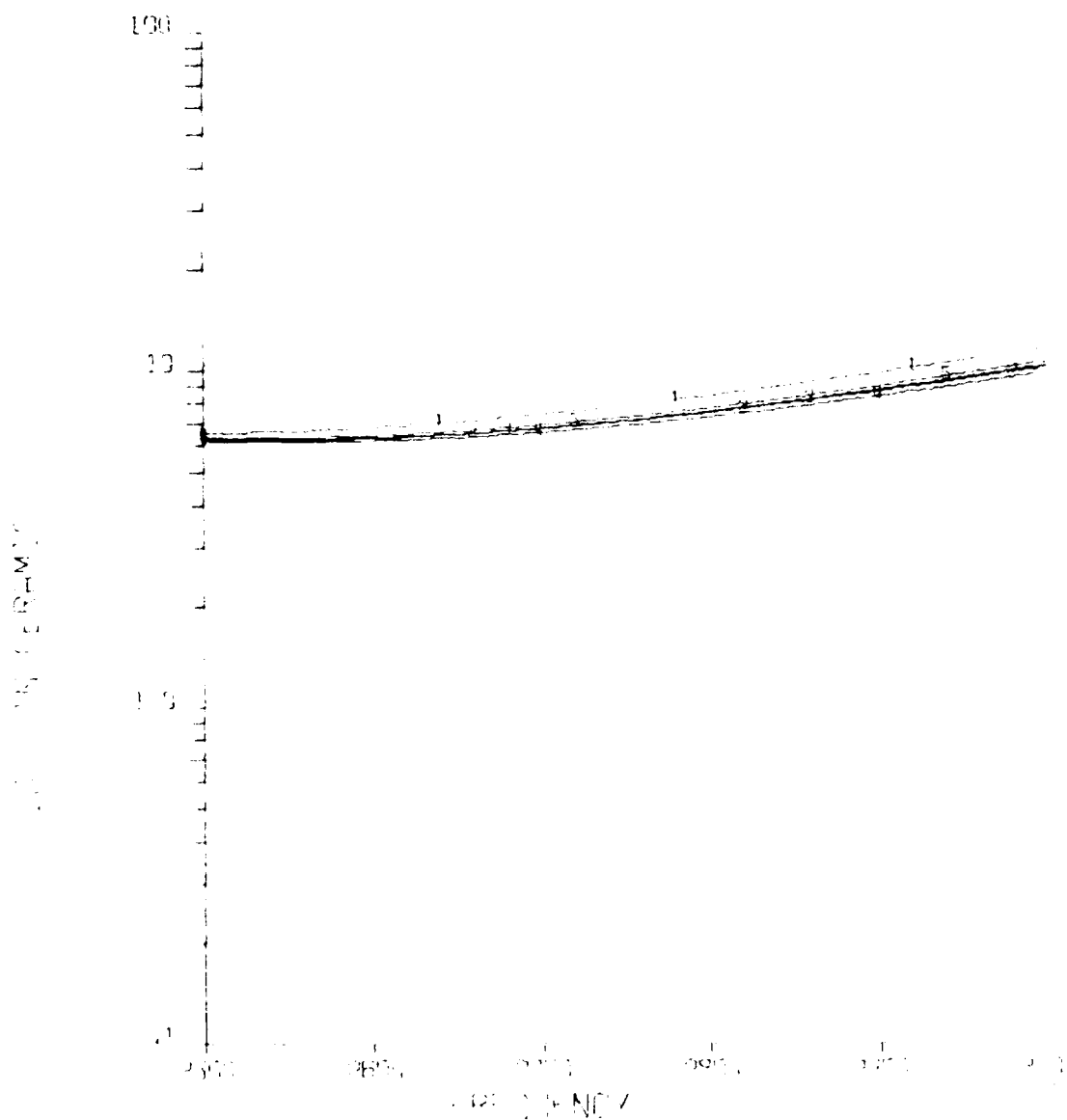
TRG DUMILGAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0,20)
 LP=.3013 QP=E+50 CS=.1949E-7 DS=0



LOSS IN CERAMIC VERSUS FREQUENCY

CPR	MAX	1.662	10000	10000
CPR	MIN	1.620	10000	10000
CPR	MAX	1.112	10000	10000
CPR	MIN	1.070	10000	10000
CPR	MAX	1.000	10000	10000

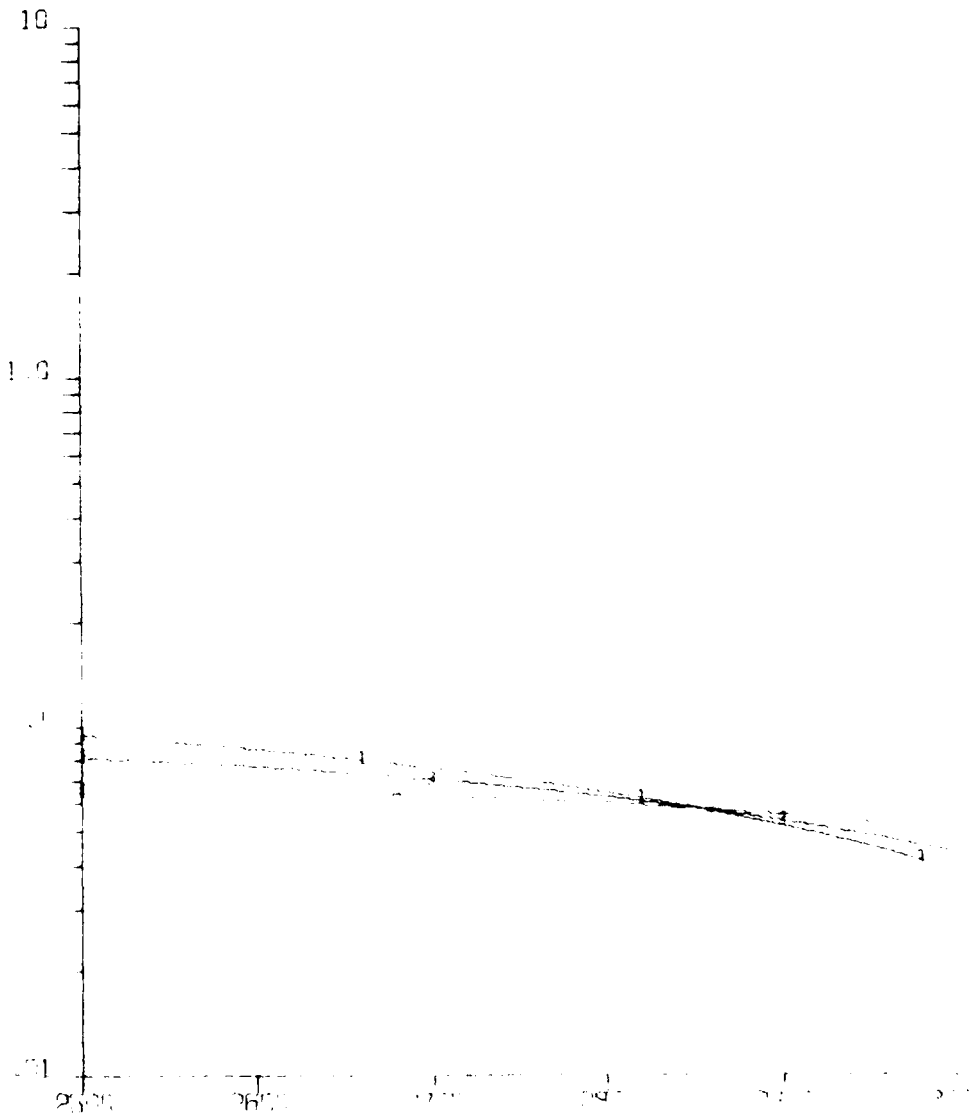
TRG DLMILGAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=3013 CP=450 CS=19495-7 DS=0



1.35 IN (FROM) VARIOUS FREQUENCIES

CP=1	MAX	4500	CP=1	MAX	4500
CP=1	MIN	4500	CP=1	MIN	4500
CP=1	MAX	4500	CP=1	MAX	4500
CP=1	MIN	4500	CP=1	MIN	4500
CP=1	MAX	4500	CP=1	MAX	4500

TRG DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (S.C.)
 LP=.3013 QP=E+50 CS=.1949E-7 DS=0

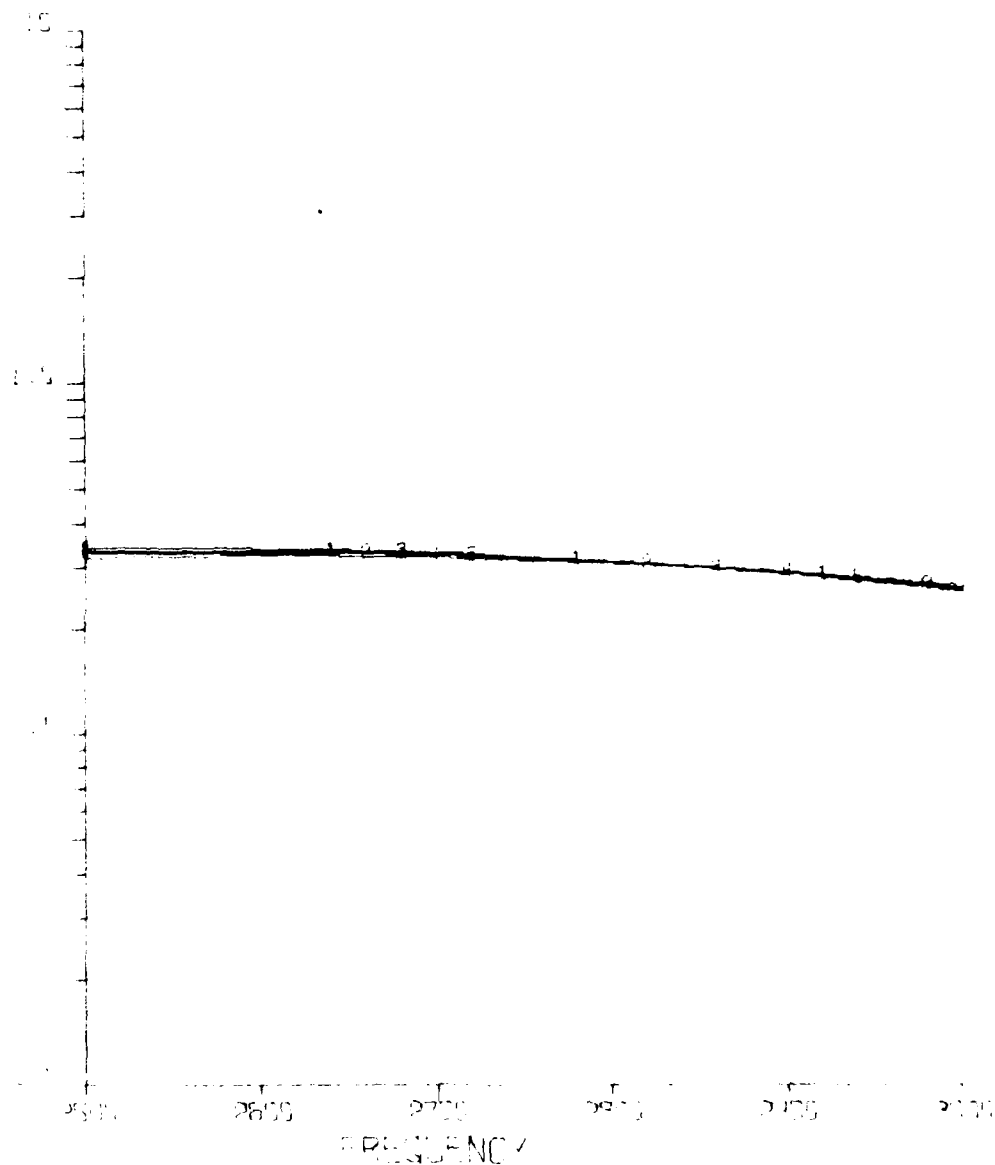


END OF DATA

MAILED 11/13/73 APR 1 1974

Q1P1 = 1.000000E+00 MAX PP 1.000000E+00 1.000000E+00
 Q1P2 = 1.000000E+00 MIN P 1.000000E+00 1.000000E+00
 Q1P3 = 1.000000E+00 1.000000E+00 1.000000E+00

TRG DUMILGAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (C,30)
 LP=.3013 GP=E+50 CS=.1949E-7 DS=0



MAGNITUDE VERSUS FREQUENCY

MAX	PP: 9=1.65212221E+04+JP.10588018E+02
MIN	P 12.52714000E+02 JP.01288300E+02
MAX	X 19.44271171E+02 J1.00617606E+04
MIN	Y 9.13545021E+02 J1.00231752E+02
AVE	0.00001498E+02 J6.24021506E+02

10

2000

200

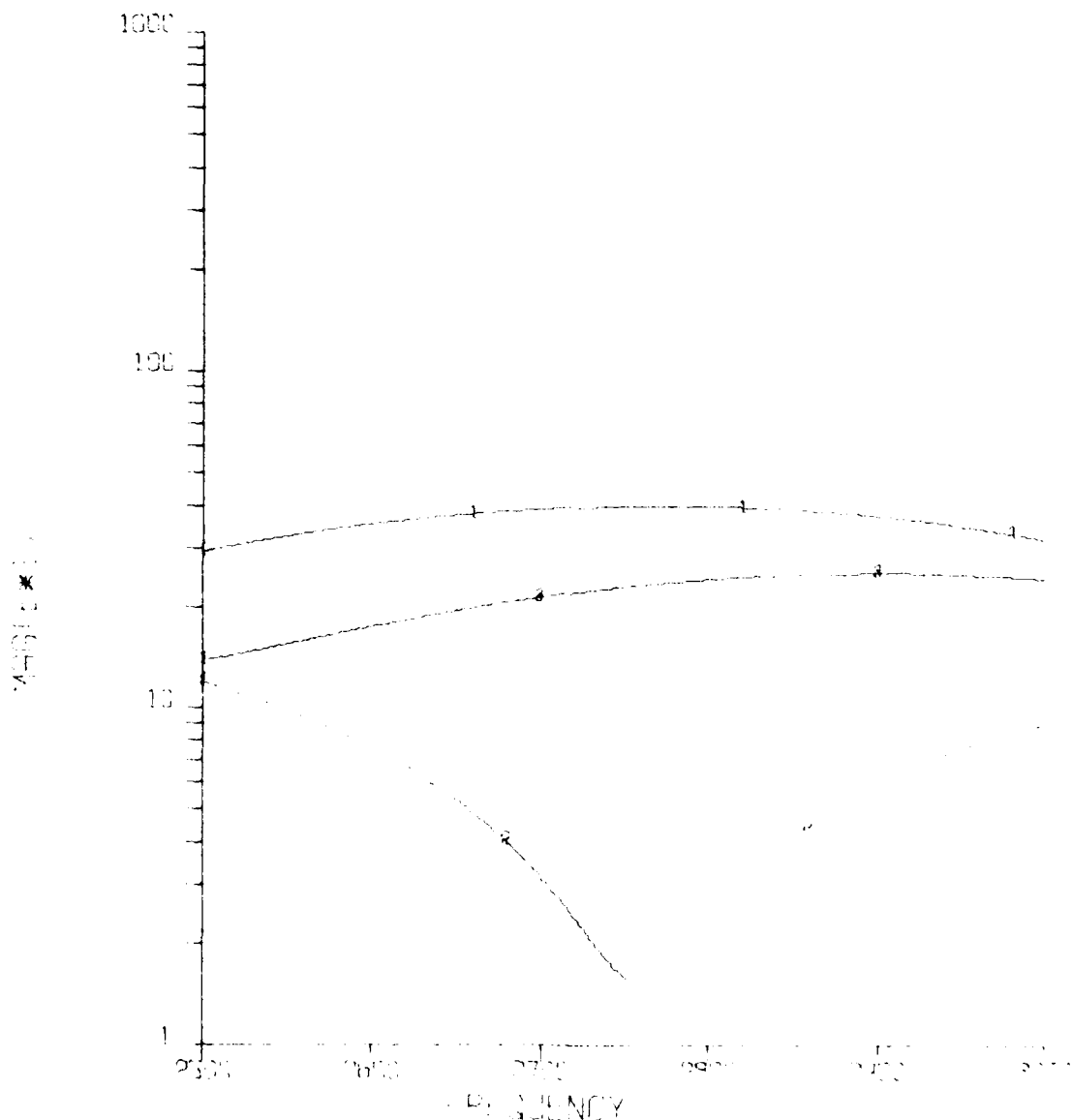
24.

6. 1997

M-71, 00000000000000000000

[] P-1	MAY 1968	RECEIVED
[] P-2	MAY 1968	RECEIVED
[] P-3	MAY 1968	RECEIVED
[] P-4	MAY 1968	RECEIVED
[] P-5	MAY 1968	RECEIVED
[] P-6	MAY 1968	RECEIVED

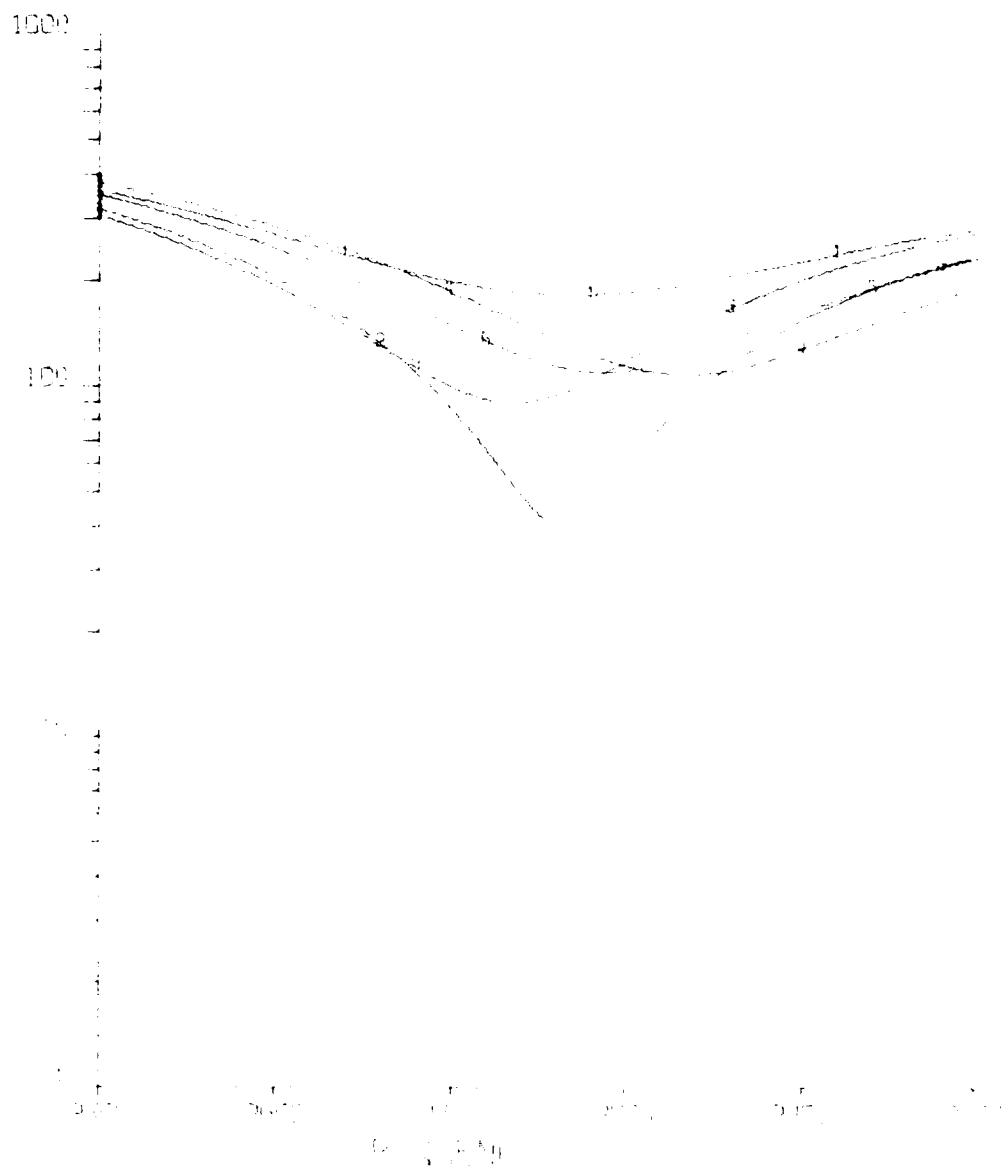
TRG DUMILOAD I
 C.F. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=.3013 QP=.450 CS=.1949E-7 DS=0



MAGNITUDE VALUES ARE NOMINAL

CURVE 1 MAX PR = 4.0241E-14 (2.0931E-14)
 CURVE 2 MIN PR = 4.0164E-14 (2.0921E-14)
 CURVE 3 PR = 4.0506E-14 (2.0916E-14)

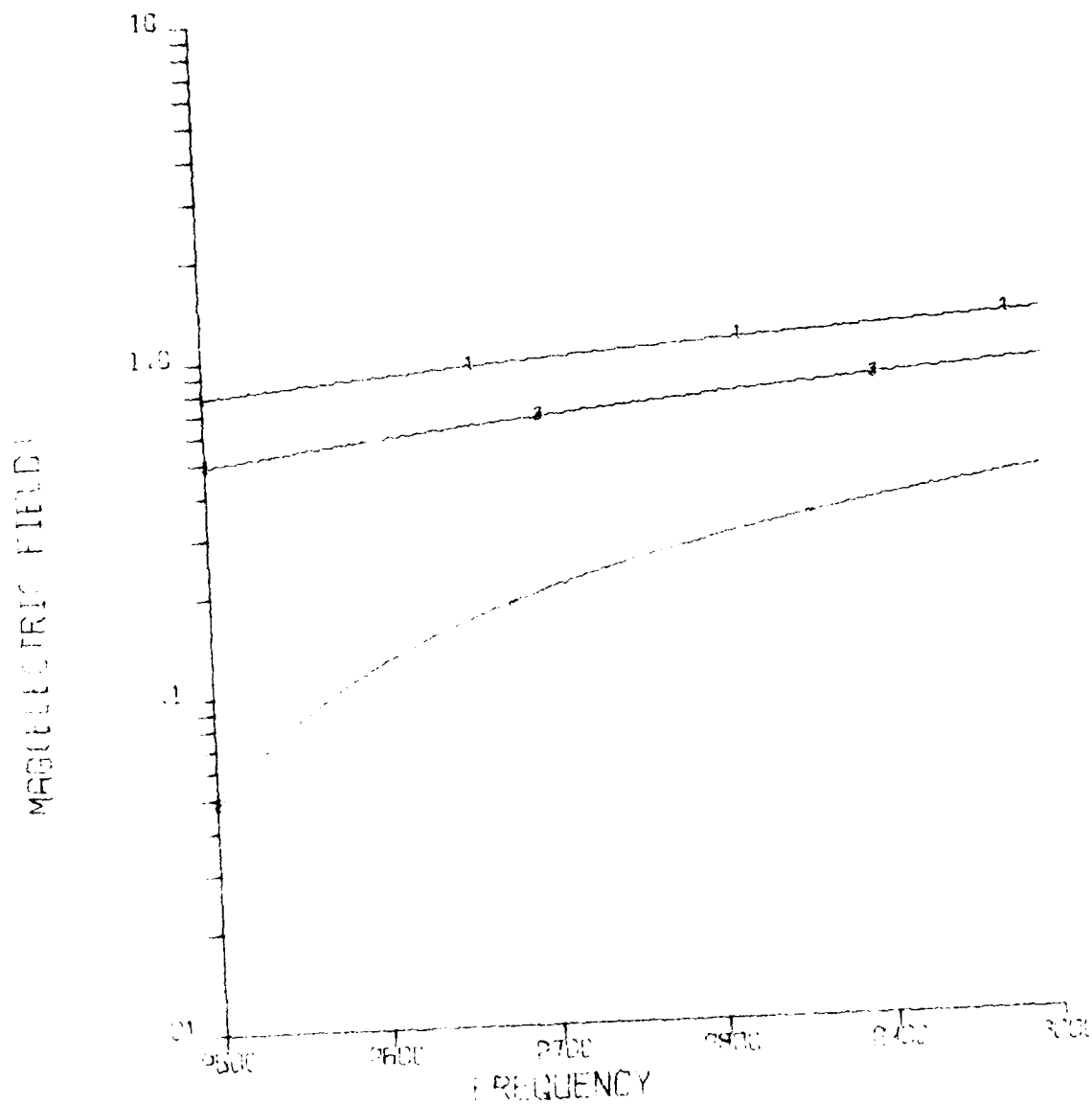
TRD CLMII GAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 60 DEGREE (C, 30)
 LP-3012 CPE-55 CS-19495-7 D9-5



MO. 1951 11 27 10 11 AM
 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000
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 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000
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 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000

[illegible]

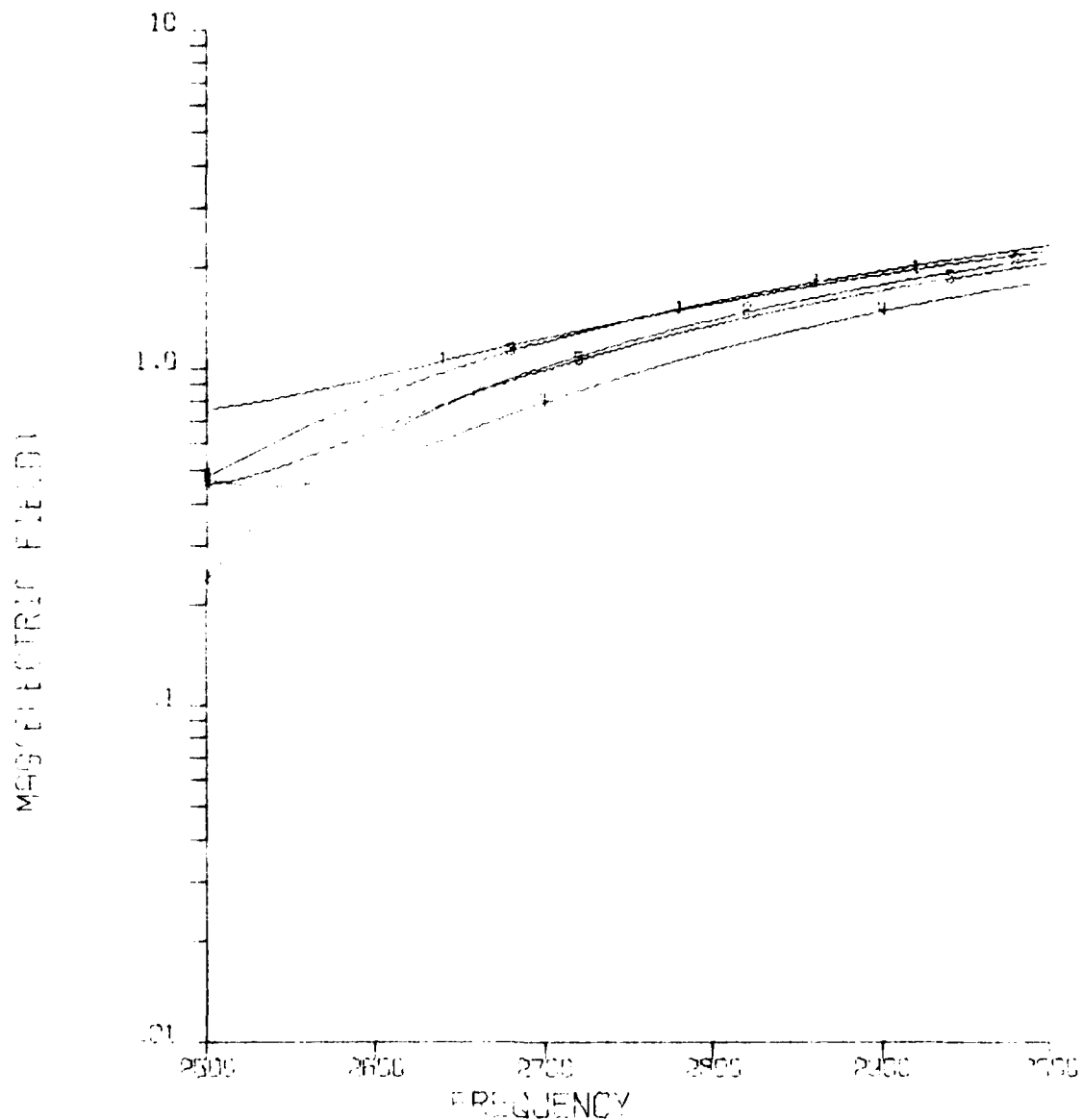
TRG DUMILOAD 1
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (C,C)
 LP=.3013 SP=E+50 CS=.1949E-7 DS=0



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PR 04.039 77615 04+ J9.493039 70E 04
 CURVE 2 - MIN R 03.501690 17E 02+ J9.481351 08E 03
 CURVE 3 - AVG 03.050850 07E 04+ J5.267816 65E 04

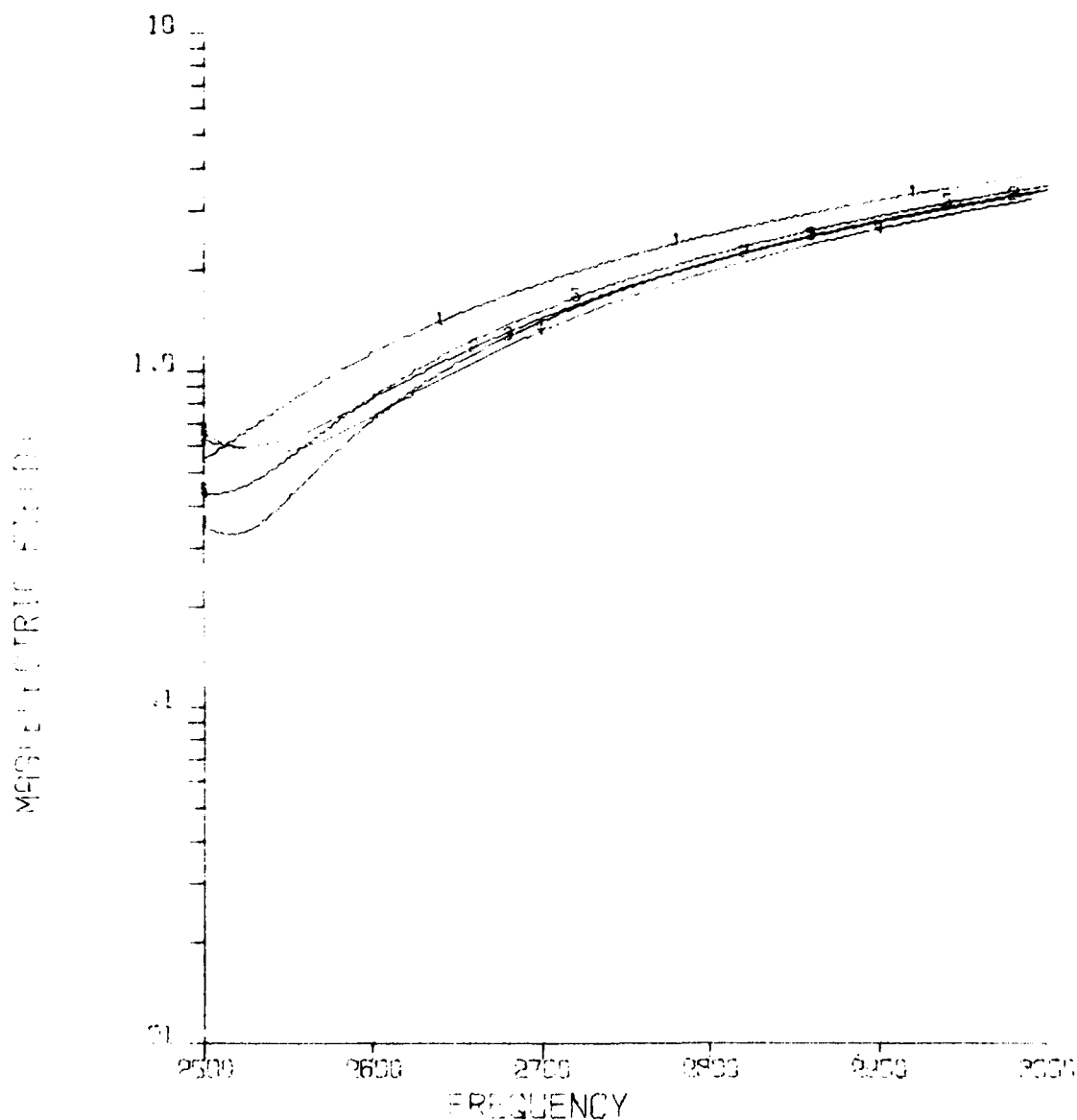
TRG DUMILOAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.3013 QP=2+50 CS=.1949E-7 DS=0



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 = MAX P	1.65302281E04+J8.10088048E03
CURVE 2 = MIN P	1.53874880E03+J9.01288789E03
CURVE 3 = MAX X	1.44730171E03+J1.20617606E04
CURVE 4 = MIN X	1.23245086E03+J1.52307533E03
CURVE 5 = AVG	1.30594457E03+J6.38905526E03

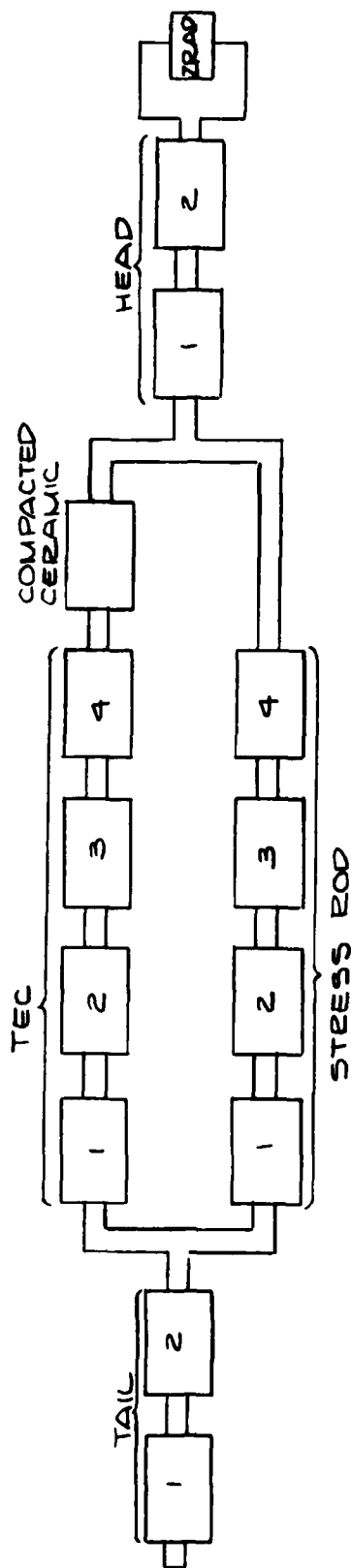
TRG DUMILCAD I
 C.P. 1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0,90)
 LP=.3013 CP=E+50 CS=.1949E-7 DS=0



MAG(ELECTRIC FIELD) VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =3.04807449E03+J2.73095796E03
 CURVE 3 - MIN R =3.38636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E02+J1.41083002E03
 CURVE 5 - AVG =5.07257123E03+J4.58678978E03

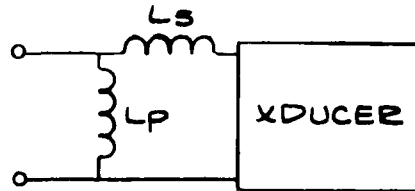
C.P. I.I



TRACOR, INC 1 DWG G-36-4
AUSTIN, TEXAS 5.9.66 LAGROWE/CL

ITERATIVE DESIGN I C.P. 1.1
5 INCH CIRCULAR HEAD

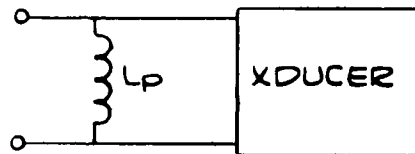
LOW BAND



$$L_s = 1.731308602 \times 10^{-1} \quad Q_s = 10^{50}$$

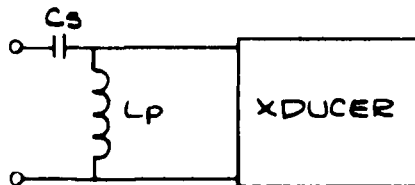
$$L_p = 7.5355770580 \times 10^{-1} \quad Q_p = 10^{50}$$

MID BAND



$$L_p = 4.850922499 \times 10^{-1} \quad Q_p = 10^{50}$$

HIGH BAND



$$L_p = 3.295176519 \times 10^{-1} \quad Q_p = 10^{50}$$

$$C_s = 2.09367 \times 10^{-8} \quad D_s = 0.0$$

DATE 4/27/66

RUN NUMBER 2-17-0020-M

NON-PIEZOELECTRIC MATERIAL PARAMETERS
ACTIVE TRANSDUCER
VOLTAGE CONTROL

SECTION NAME	PIECE NO.	PIECE TYPE	DENSITY	LENGTH	LEFT AREA	RIGHT AREA	LONGITUDINAL VEL. OF SOUND
TAIL	1	0	7.741000E-03	1.270000E-02	2.550000E-04	2.550000E-04	4.970000E-03
	2	0	7.741000E-03	1.090000E-02	4.749590E-04	4.749590E-04	4.970000E-03
	3	0	7.741000E-03	3.900000E-03	4.972380E-04	4.972380E-04	4.970000E-03
	4	0	7.741000E-03	2.900000E-03	7.776840E-04	7.776840E-04	4.970000E-03
TAIL END CAP	1	0	7.839000E-03	4.800000E-03	2.627250E-04	5.627250E-04	5.116000E-03
	2	0	7.839000E-03	7.559040E-02	9.175550E-03	9.175550E-03	5.116000E-03
	3	0	7.839000E-03	9.525000E-03	7.884030E-03	7.884030E-03	5.116000E-03
	4	0	7.839000E-03	3.175000E-03	9.175550E-03	9.175550E-03	5.116000E-03
STRESS ROD	1	0	7.741000E-03	2.641540E-02	2.550000E-04	2.550000E-04	4.970000E-03
	2	0	7.741000E-03	2.794000E-01	1.266680E-04	1.266680E-04	4.970000E-03
	3	0	7.741000E-03	4.975000E-03	2.550000E-04	2.550000E-04	4.970000E-03
	4	0	7.741000E-03	1.090000E-02	6.693000E-04	6.693000E-04	4.970000E-03
HEAD	1	1	7.839000E-03	4.356100E-02	4.560370E-03	1.266770E-02	5.116000E-03
	2	0	7.839000E-03	1.270000E-02	1.266770E-02	1.266770E-02	5.116000E-03

INPUT PARAMETERS FOR TRANSDUCER ANALYSIS
ACTIVE CERAMIC PARAMETERS

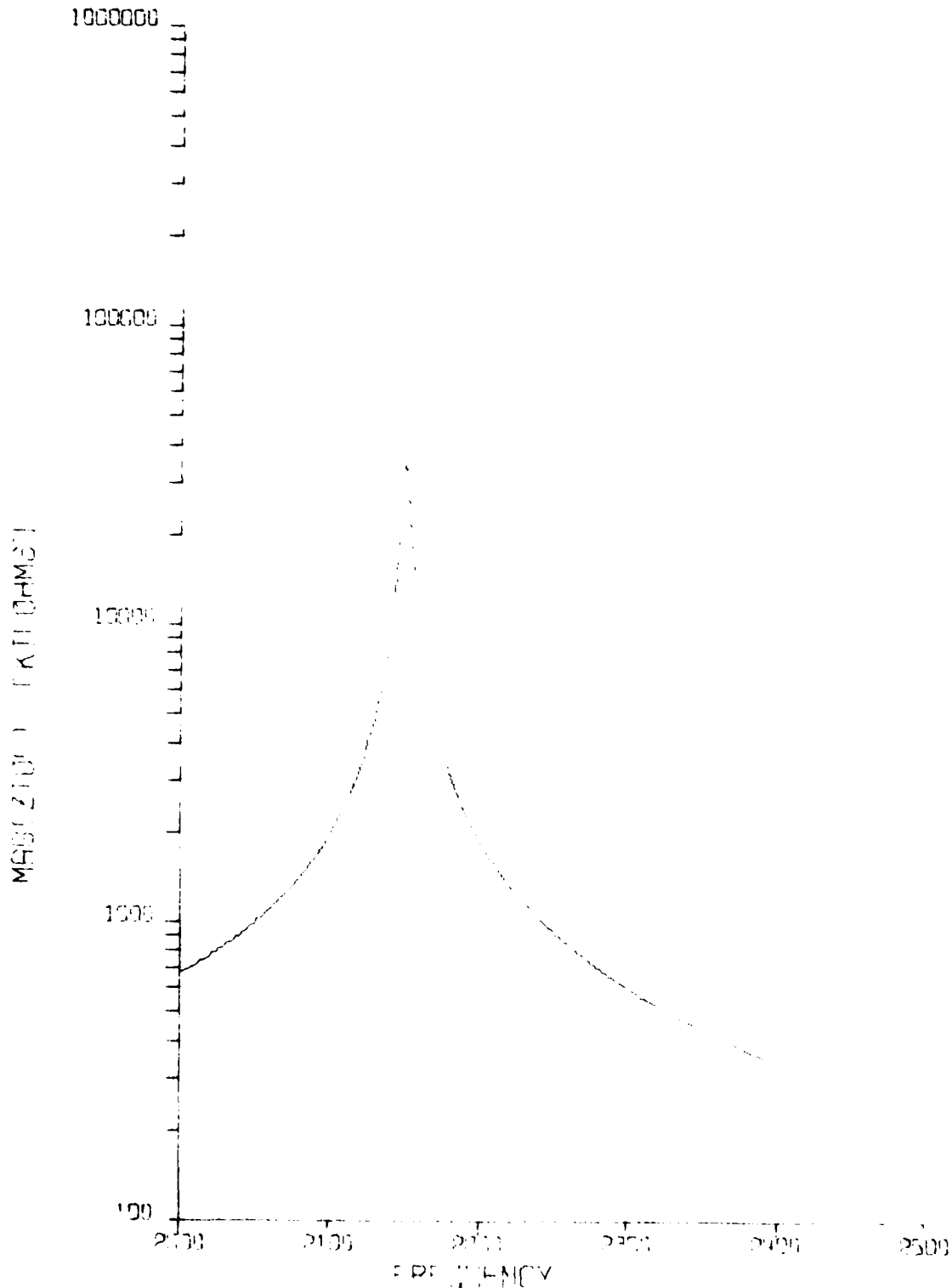
		G333		E333	
REAL	IMAGINARY	REAL	IMAGINARY	REAL	IMAGINARY
1.020550E-11	-2.480957E-14	2.279840E-02	1.744306E-05	1.280360E-03	-2.929464E-00
NO. OF RINGS	DENSITY	AREA	LENGTH		
12	1.440000E-03	2.535540E-03	1.905000E-02		

TRACOR, INC.

LOW BAND

FINAL DESIGN OF ITERATION 1
C.P. 1.1 5 INCH CIRCULAR HEAD
LOW BAND

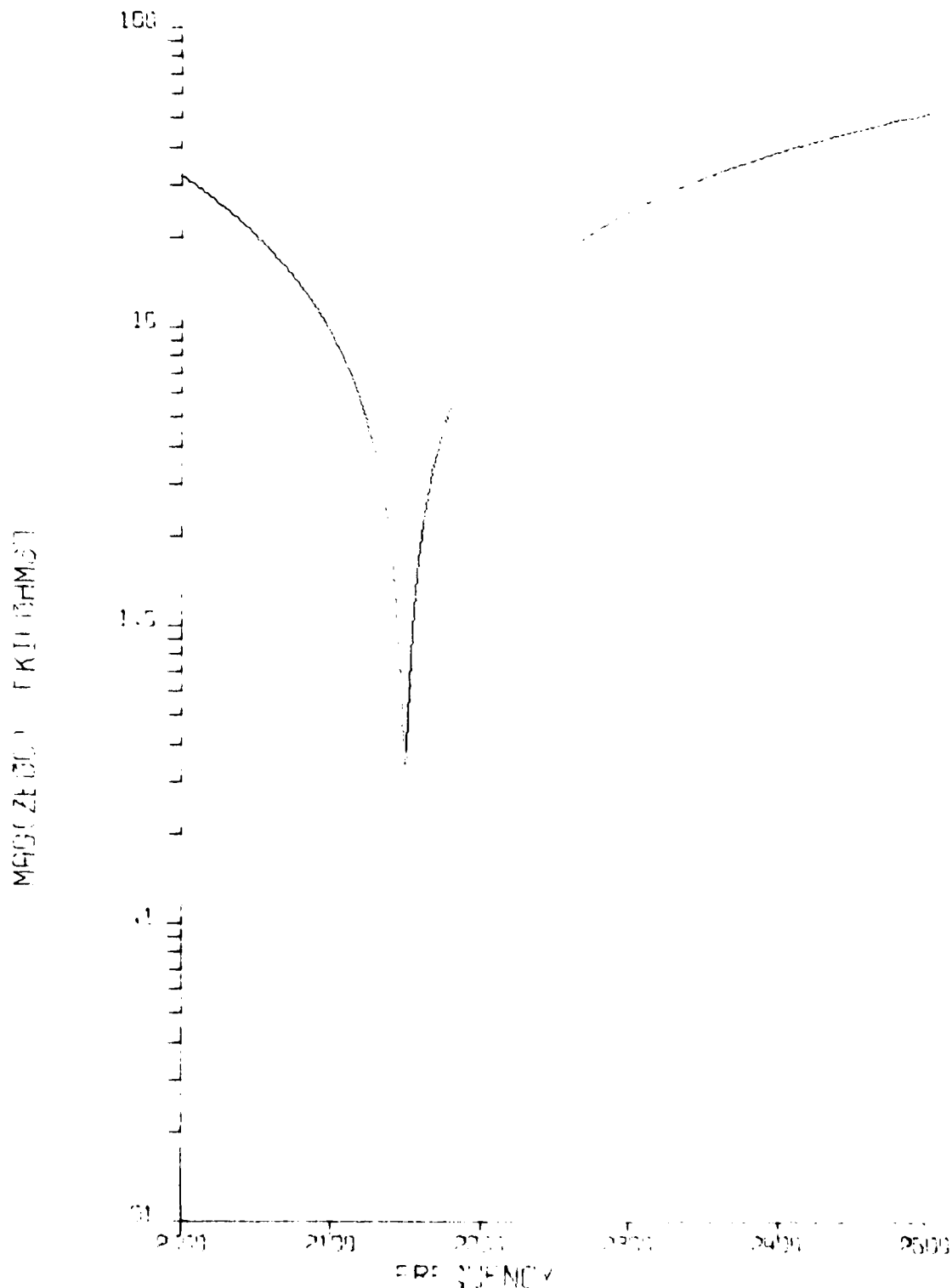
LS=.1731 GS=E+50 LP=.7536 GP=E+50



MAGNIFICATION VERSUS FREQUENCY

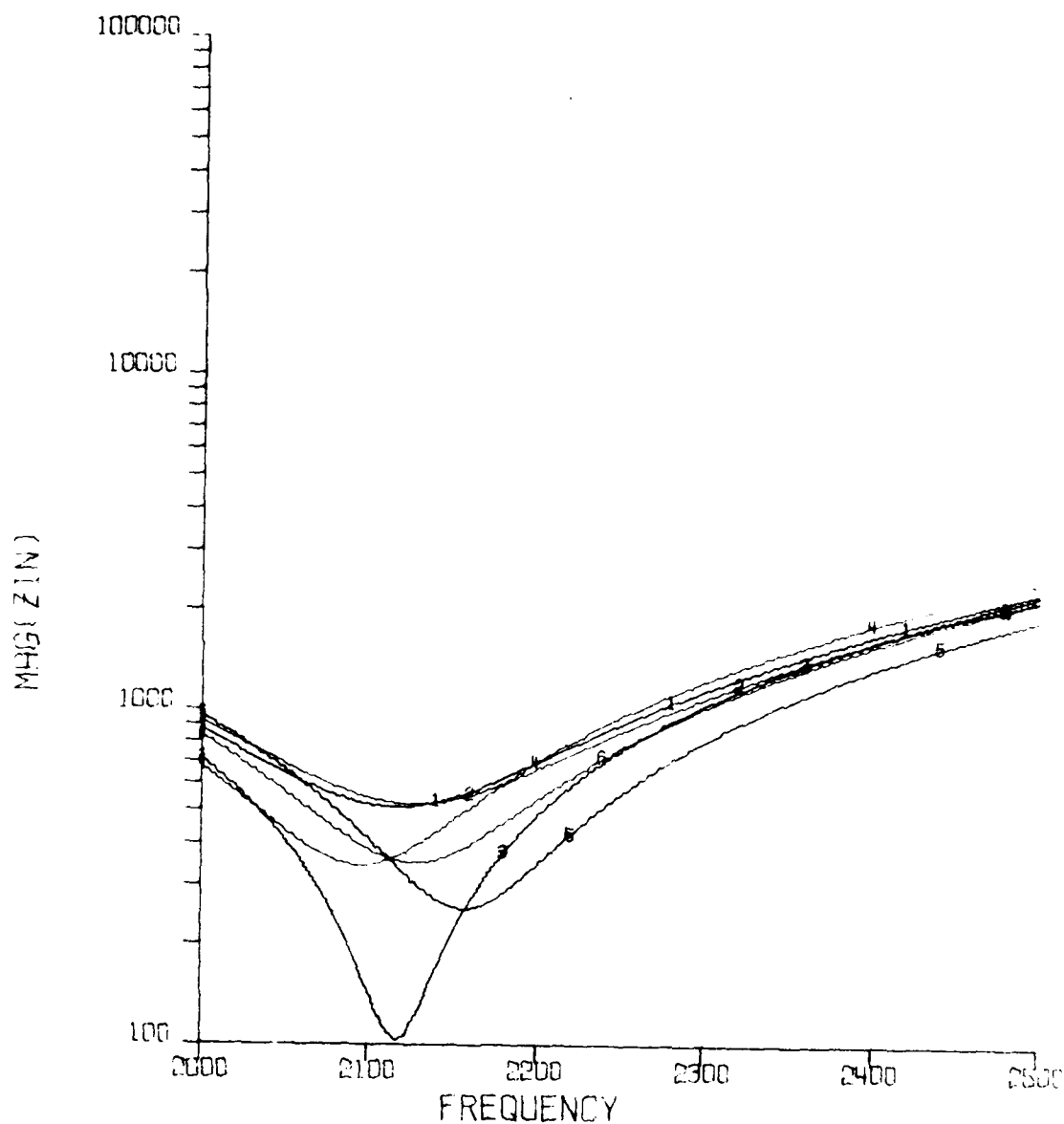
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND

LS=.1731 GS=E+50 IP=.7530 CP=E+50



MAG(ZERO) VERSUS FREQUENCY

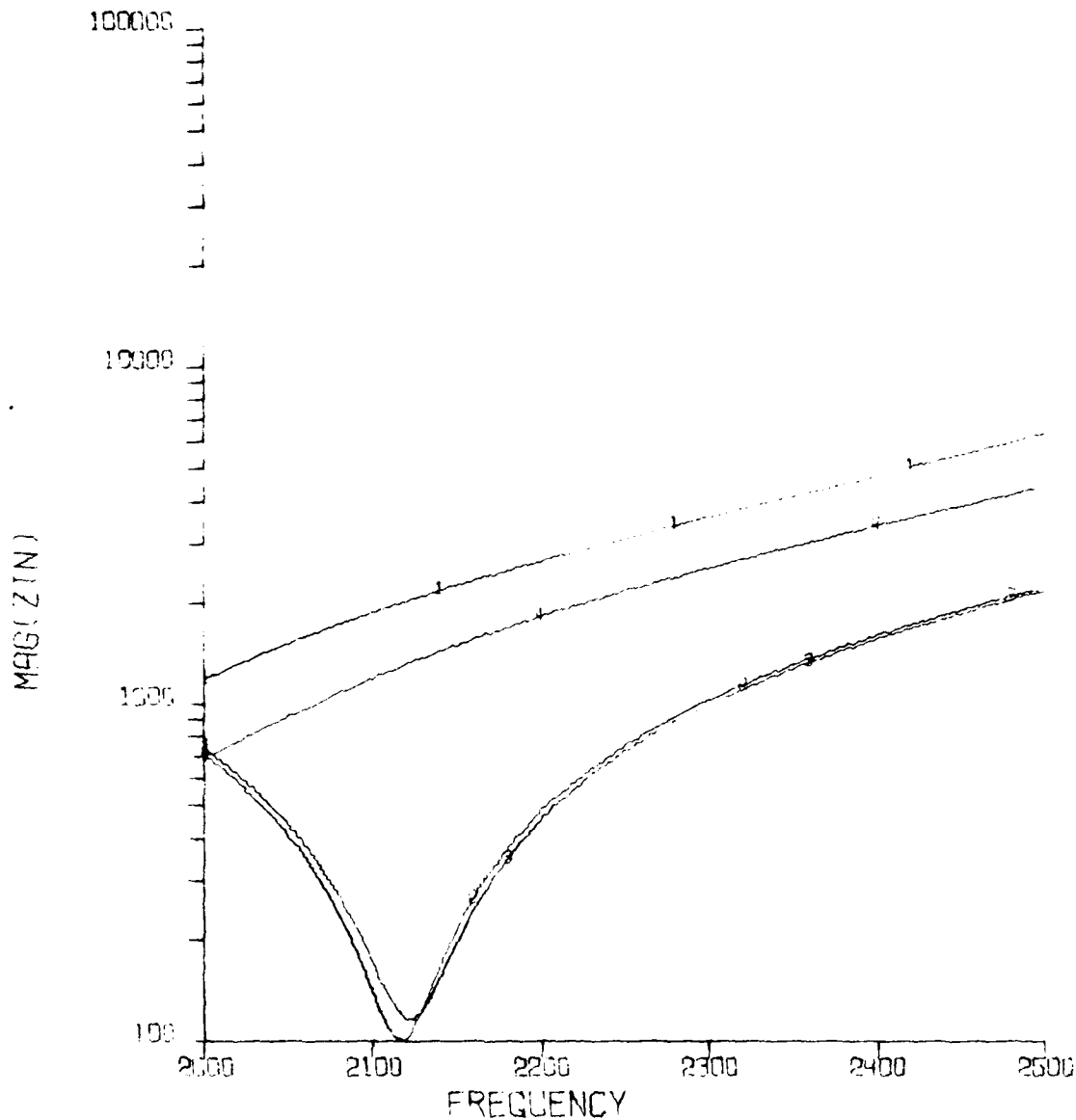
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602396E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

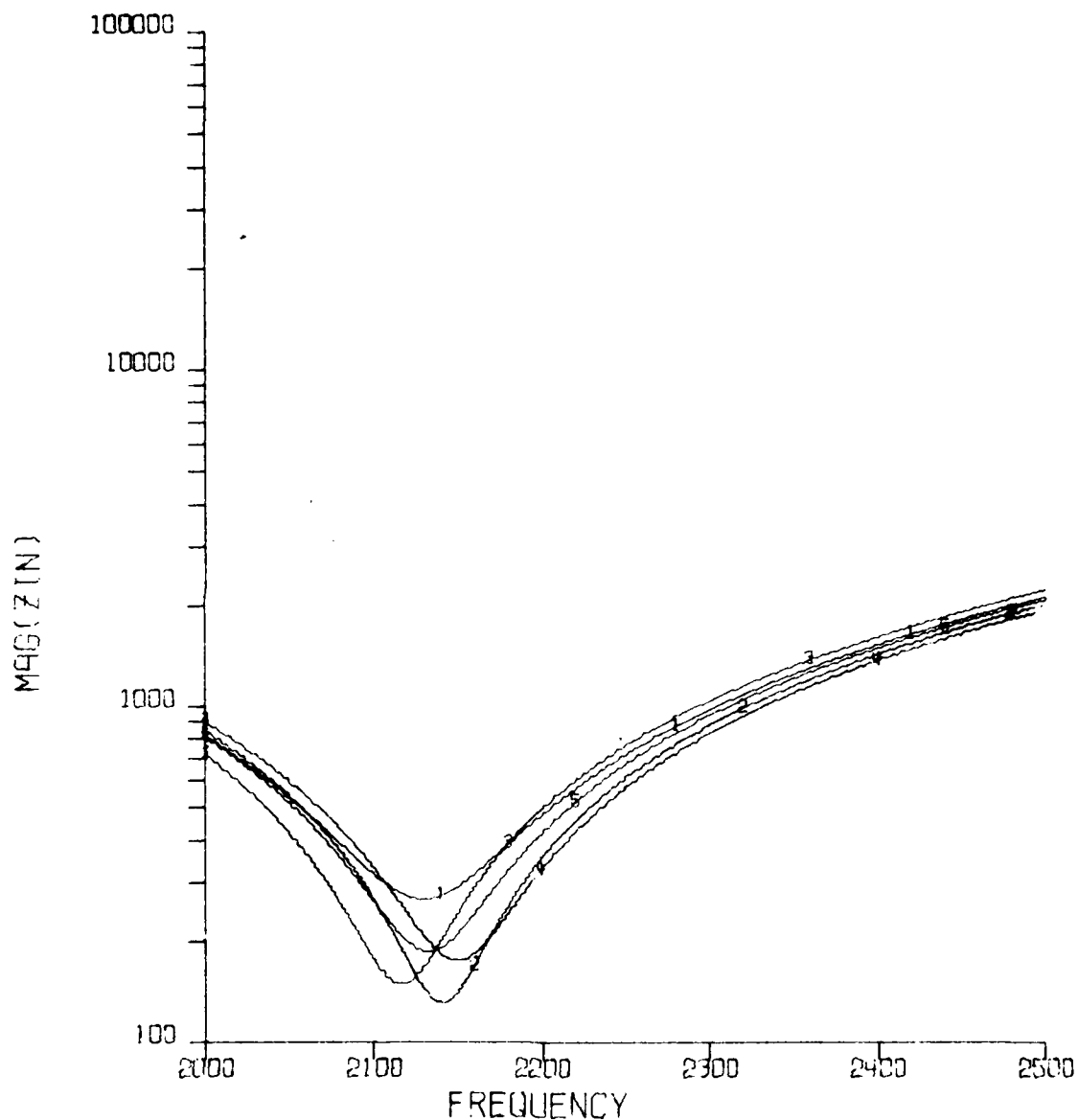
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (O.C)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84588403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

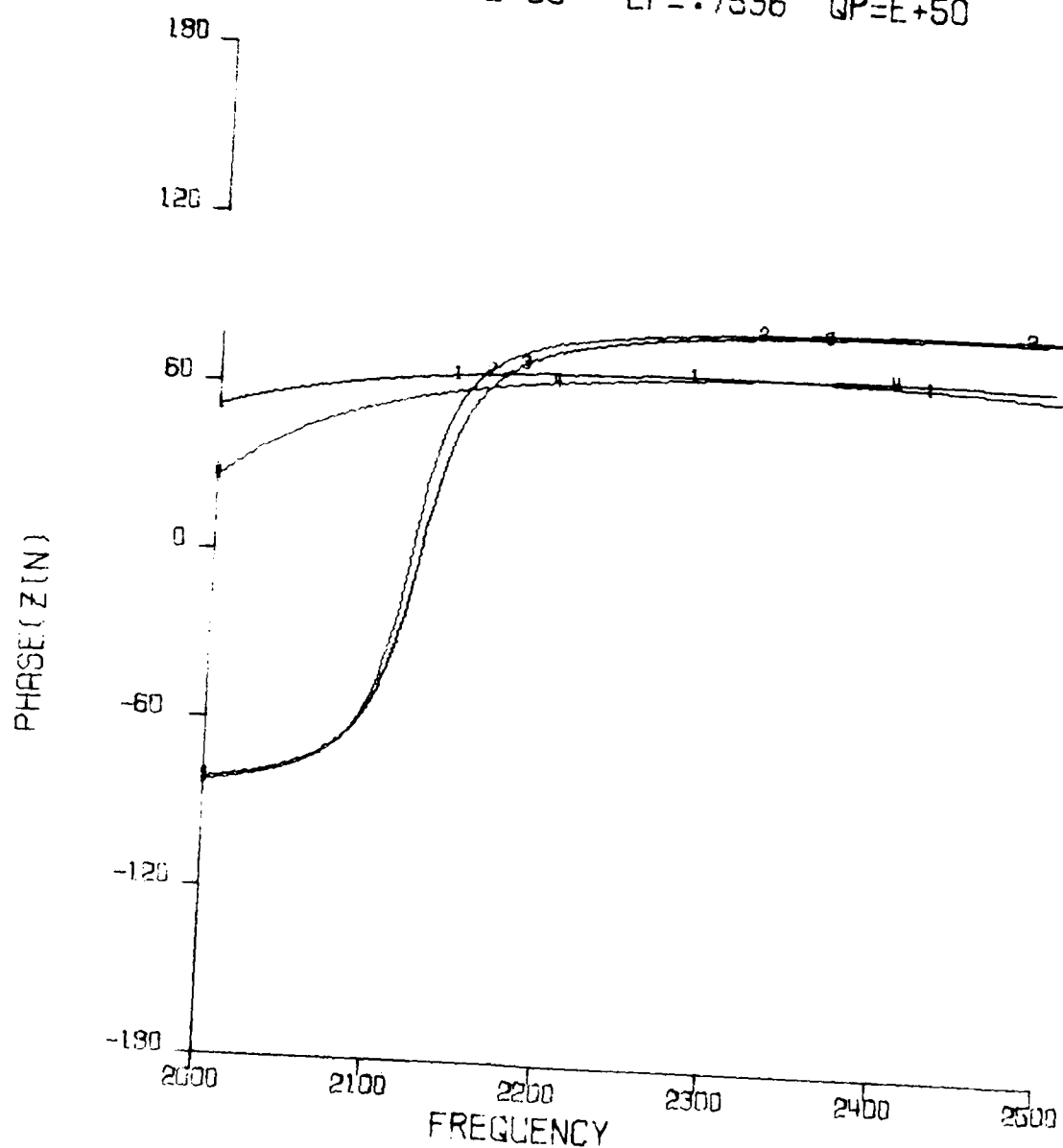
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332135E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.09428731E03

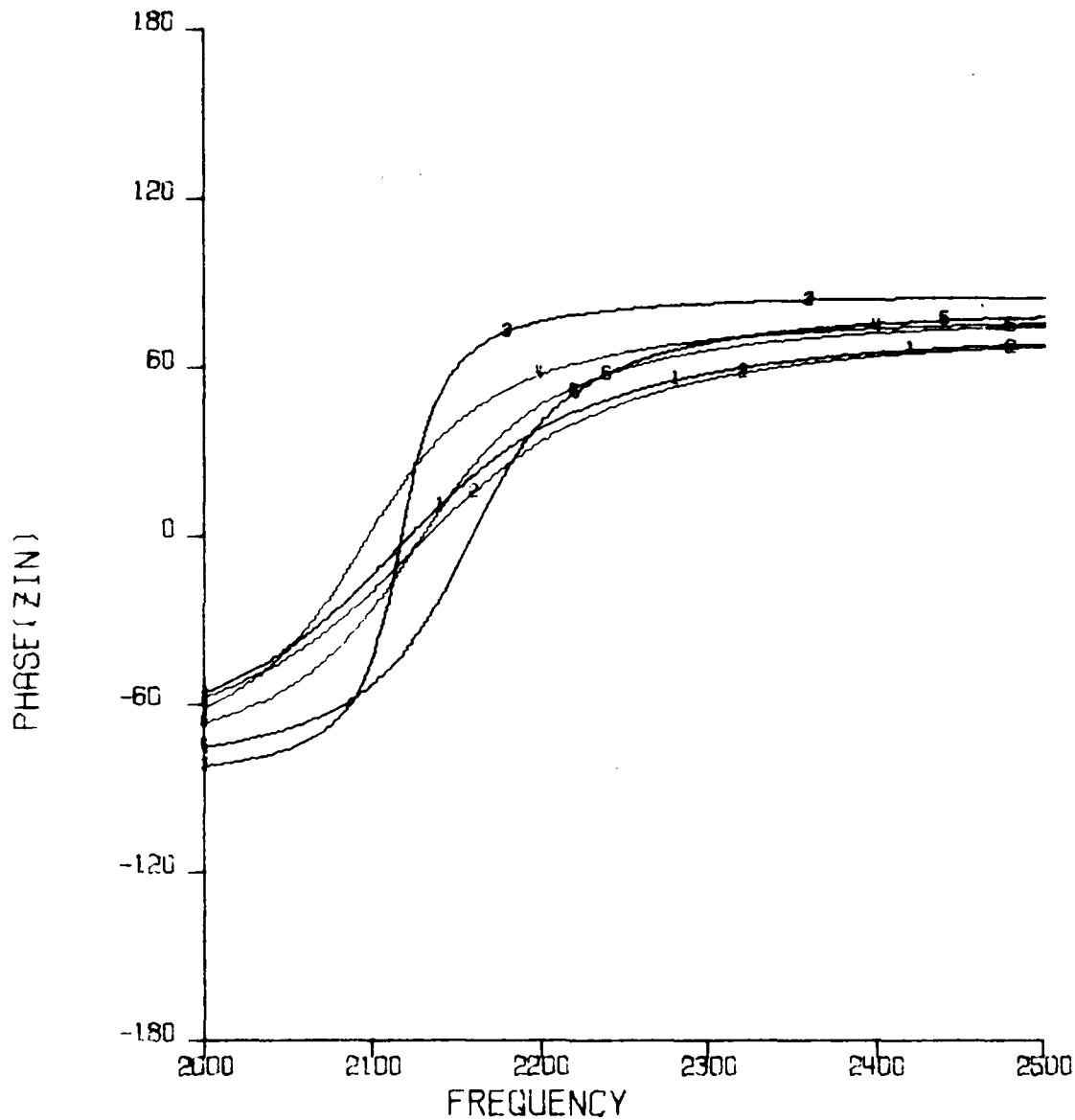
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX $PRES = 3.08590054E04 + J6.84589403E04$
 CURVE 2 - MIN R $= 3.06295372E03 + J6.15220308E03$
 CURVE 3 - MIN X $= 3.57300970E03 + J5.19126037E03$
 CURVE 4 - AVG $= 2.44205725E04 + J4.33216357E04$

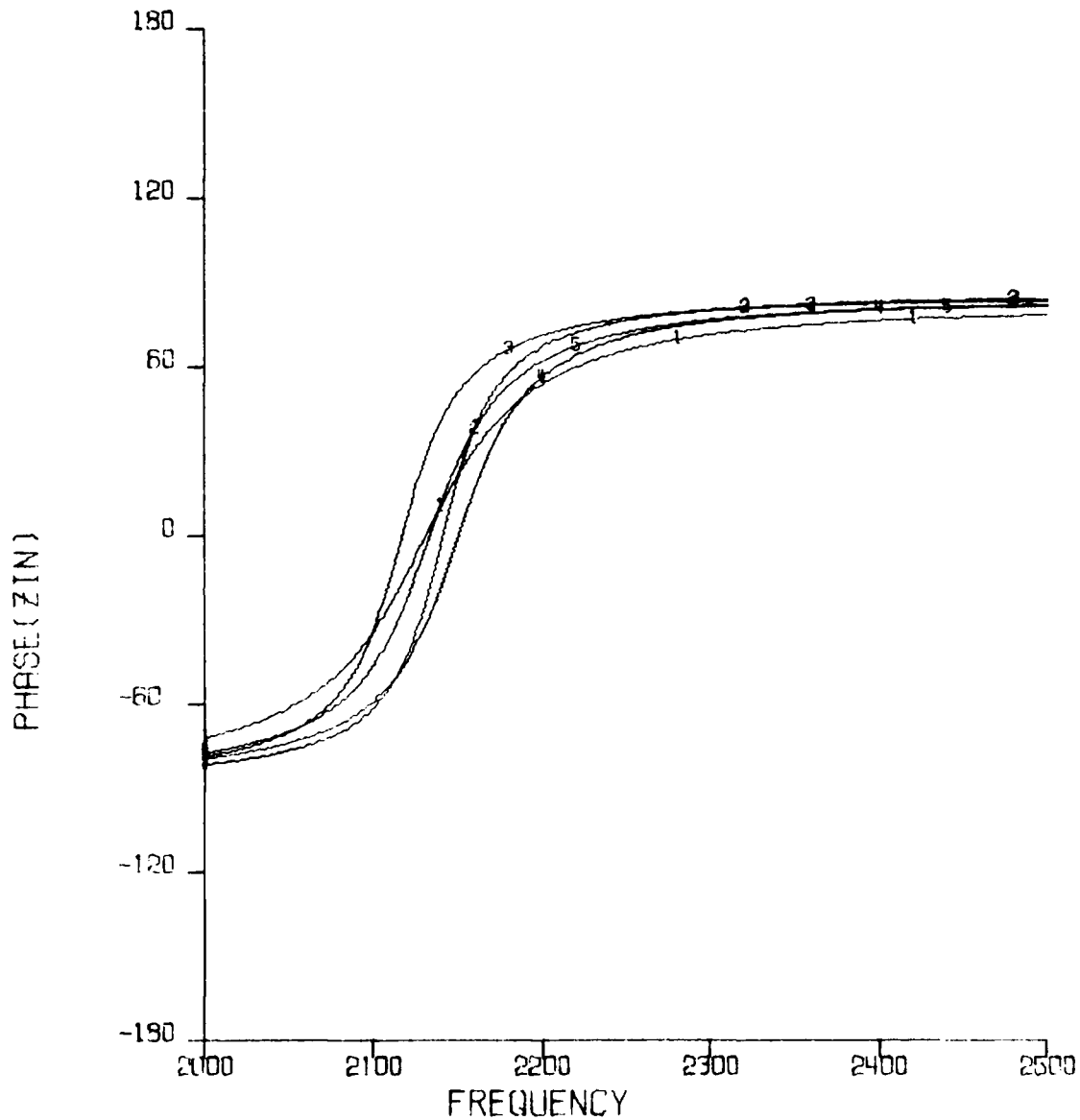
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

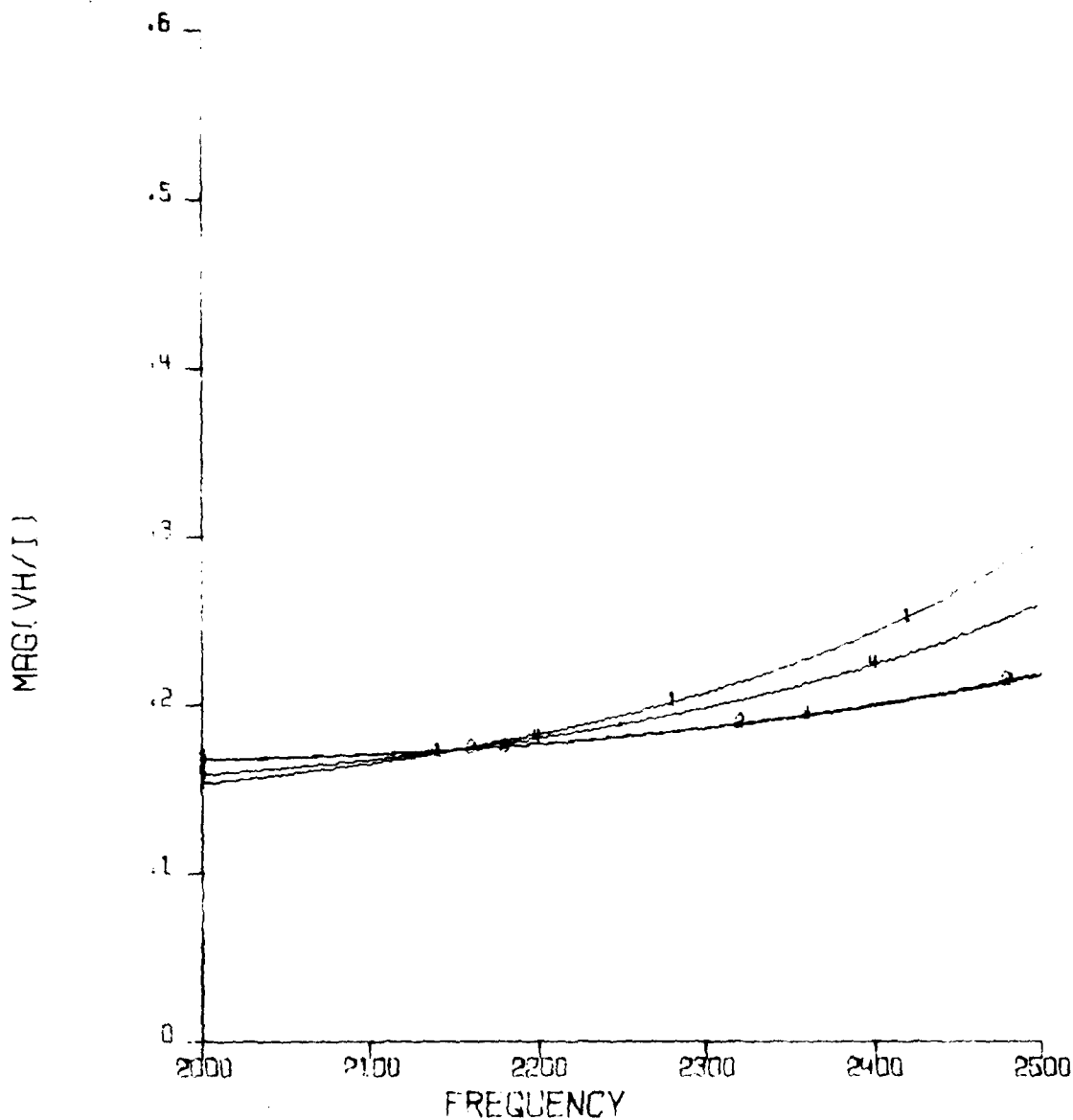
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



PHASE(ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=8.62318751E03+J3.54954775E03
 CURVE 2 - MIN R =4.04152567E03+J1.58332185E03
 CURVE 3 - MAX X =4.71313038E03+J6.22775241E03
 CURVE 4 - MIN X =5.48191309E03-J1.07796008E02
 CURVE 5 - AVG =5.92082810E03+J3.08428731E03

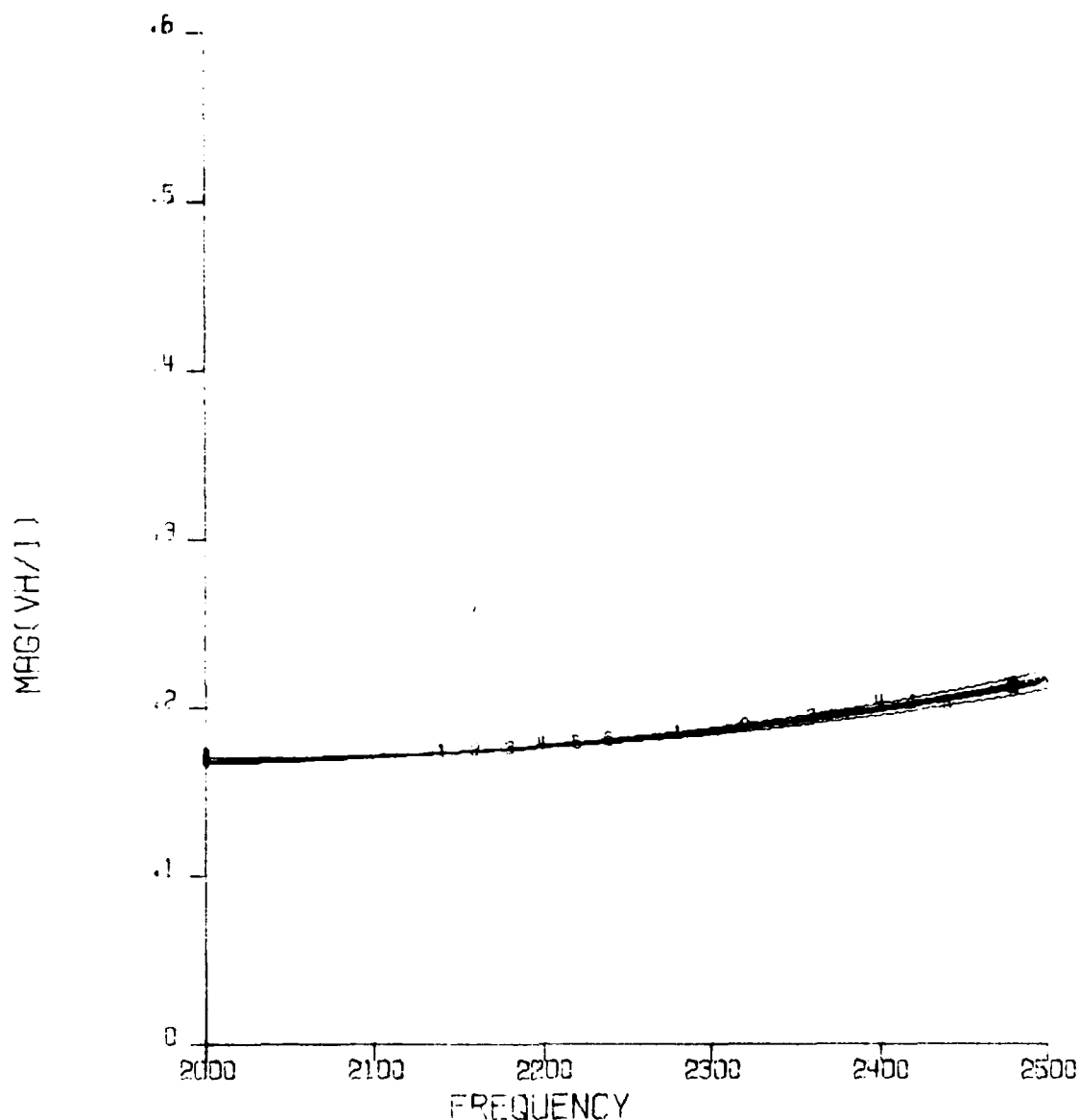
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (0,0)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08580054E04+J6.84588403E04
 CURVE 2 - MIN R =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216357E04

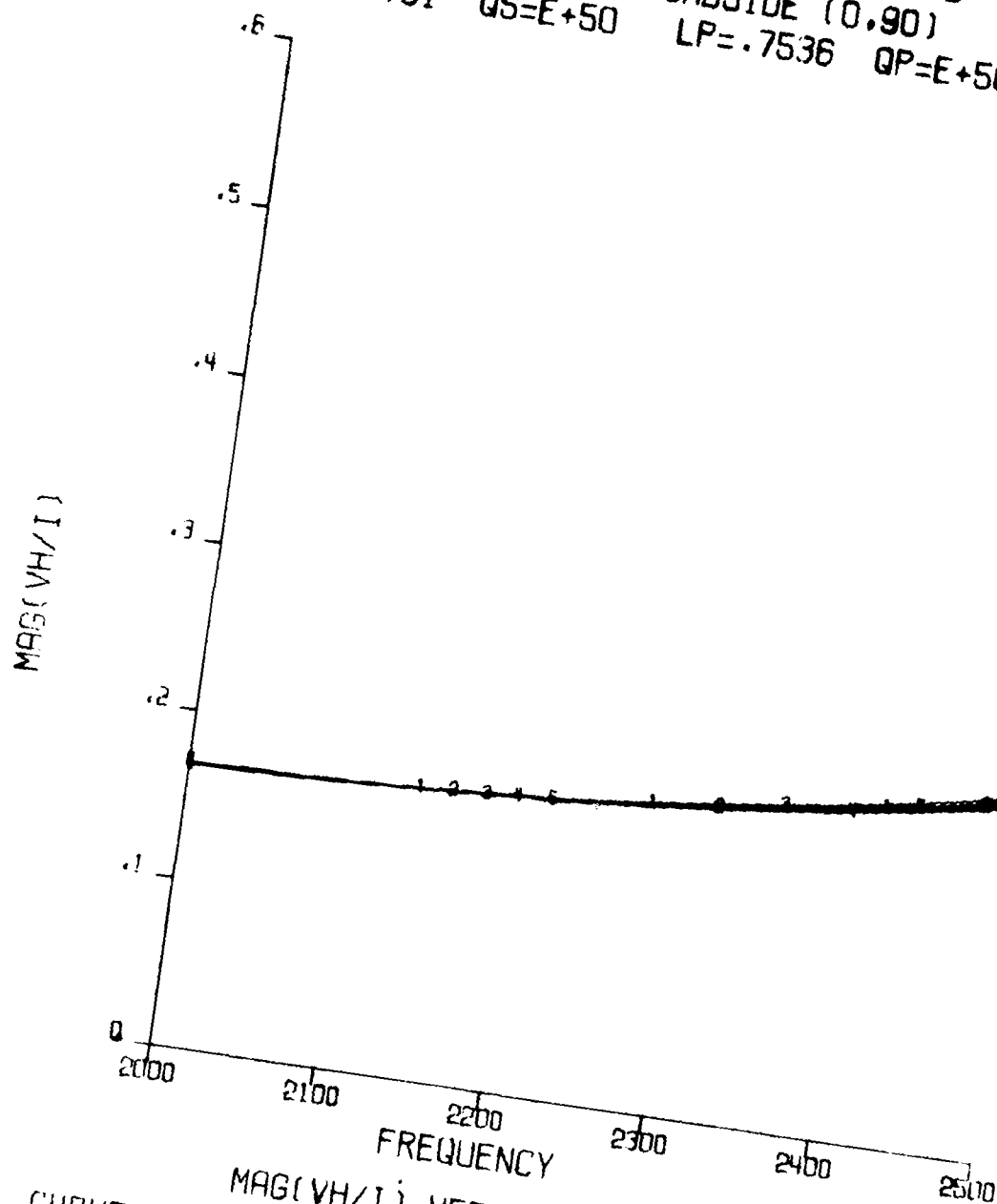
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297077E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188893E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

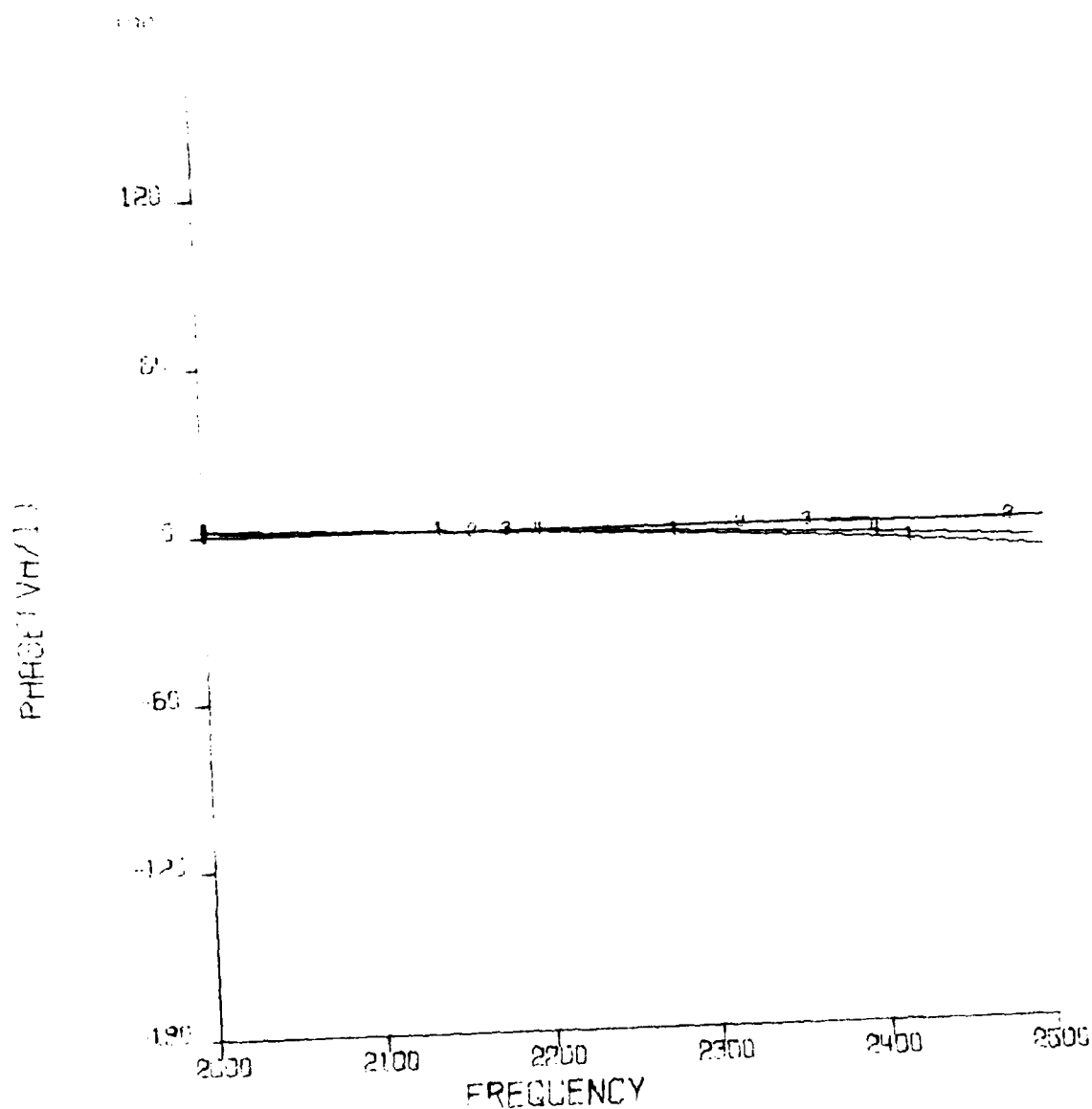
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 $LQ=.1731$ $QS=E+50$ $LP=.7536$ $QP=E+50$



MAG(VH/I) VERSUS FREQUENCY

CURVE 1 - MAX	PRES=8.62318751E03+J3.54954775E03
CURVE 2 - MIN R	=4.04152567E03+J1.58332185E03
CURVE 3 - MAX X	=4.71313038E03+J6.22775241E03
CURVE 4 - MIN X	=5.48191309E03-J1.07796008E02
CURVE 5 - AVG	=5.92082810E03+J3.08428731E03

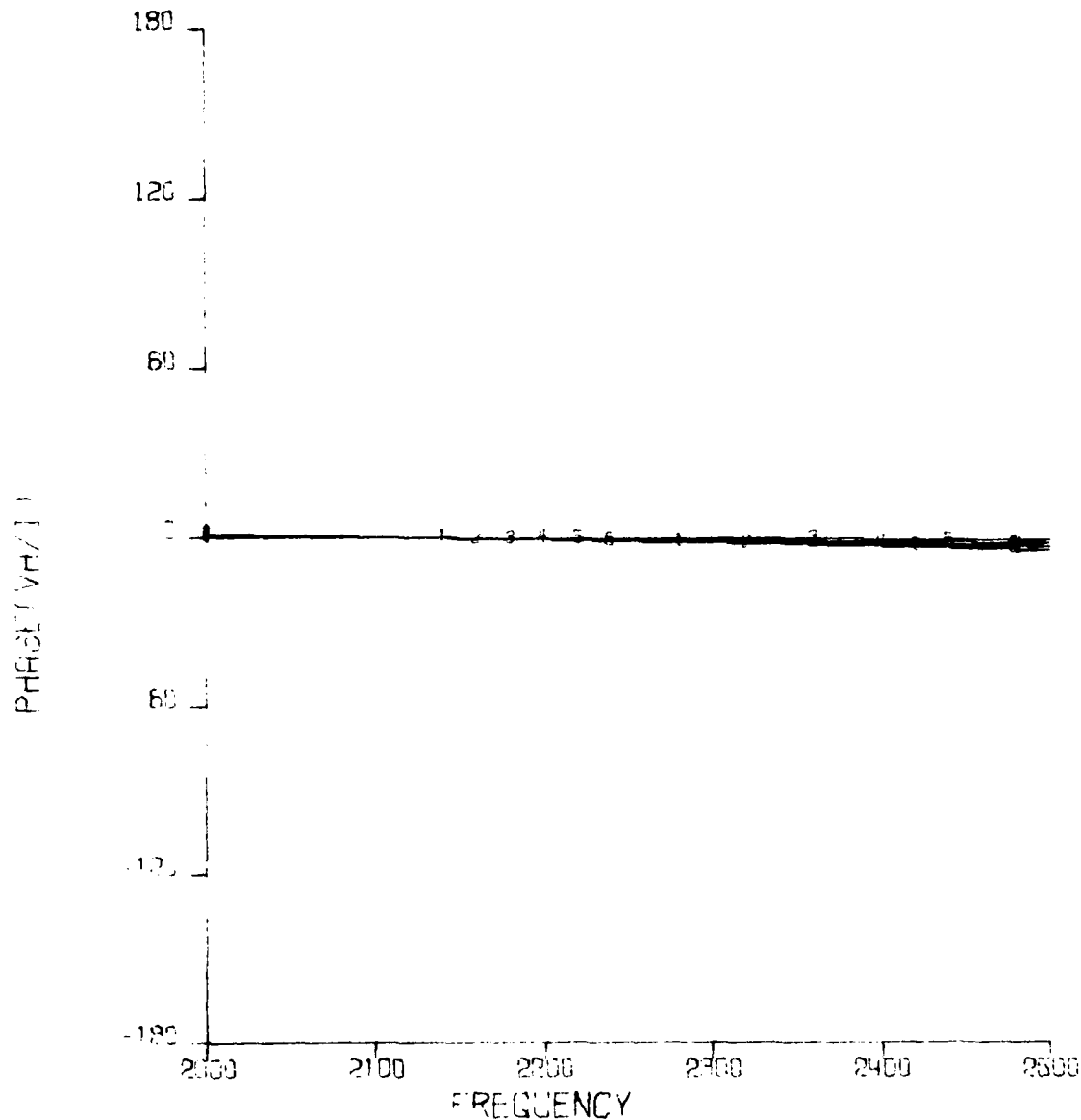
C.P. 1.1 5 INCH CIRCULAR ANTENNA
 1.5 INCH BORE
 1.5 INCH BORE
 1.5 INCH BORE



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES = $-0.08590054 + j6.84589403E04$
 CURVE 2 - MIN R = $-3.06285372E03 + j6.15220308E03$
 CURVE 3 - MIN X = $-3.57300970E03 + j5.19126037E03$
 CURVE 4 - AVG = $-2.44205725E04 + j4.33216357E04$

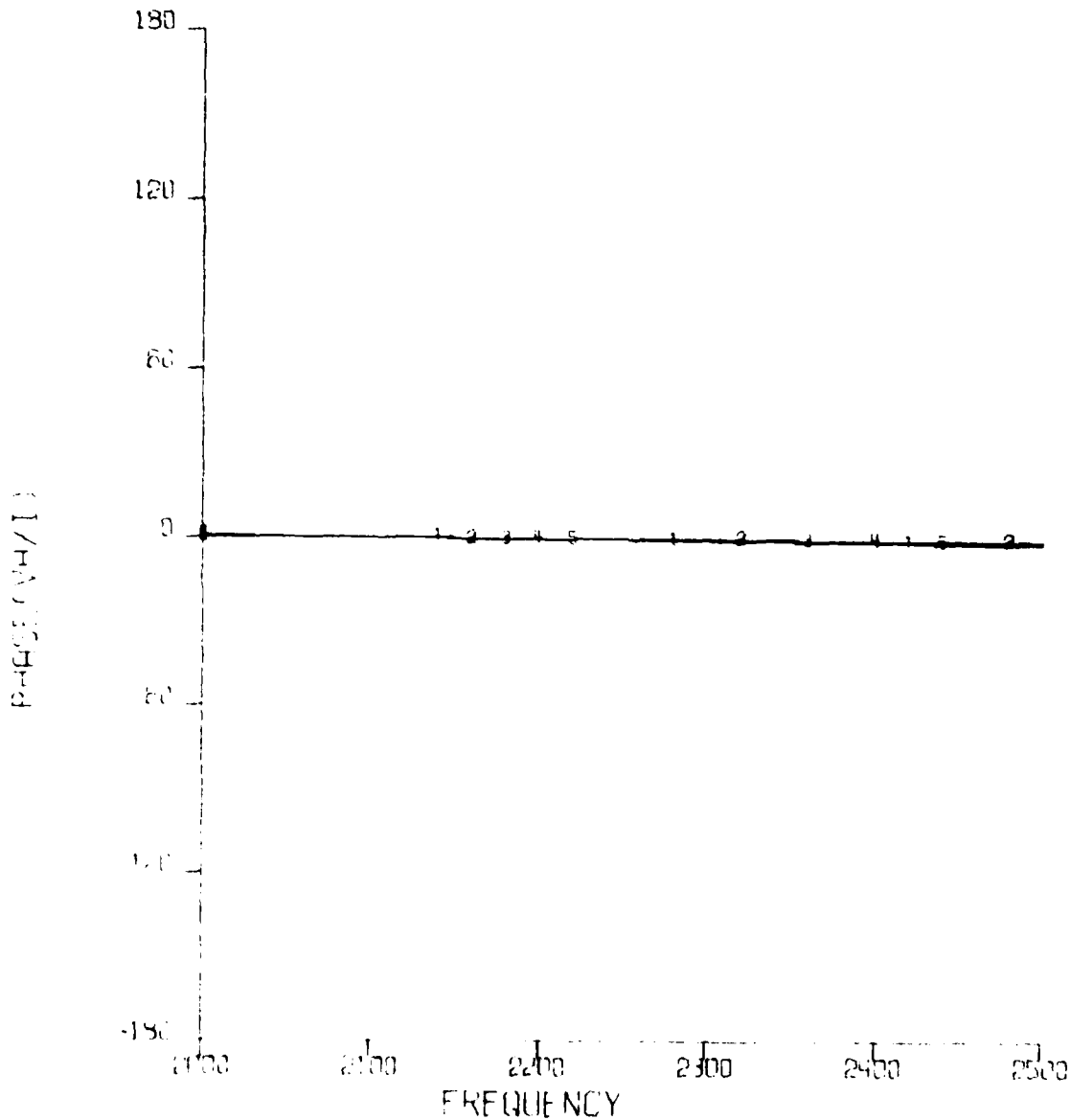
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (C.30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

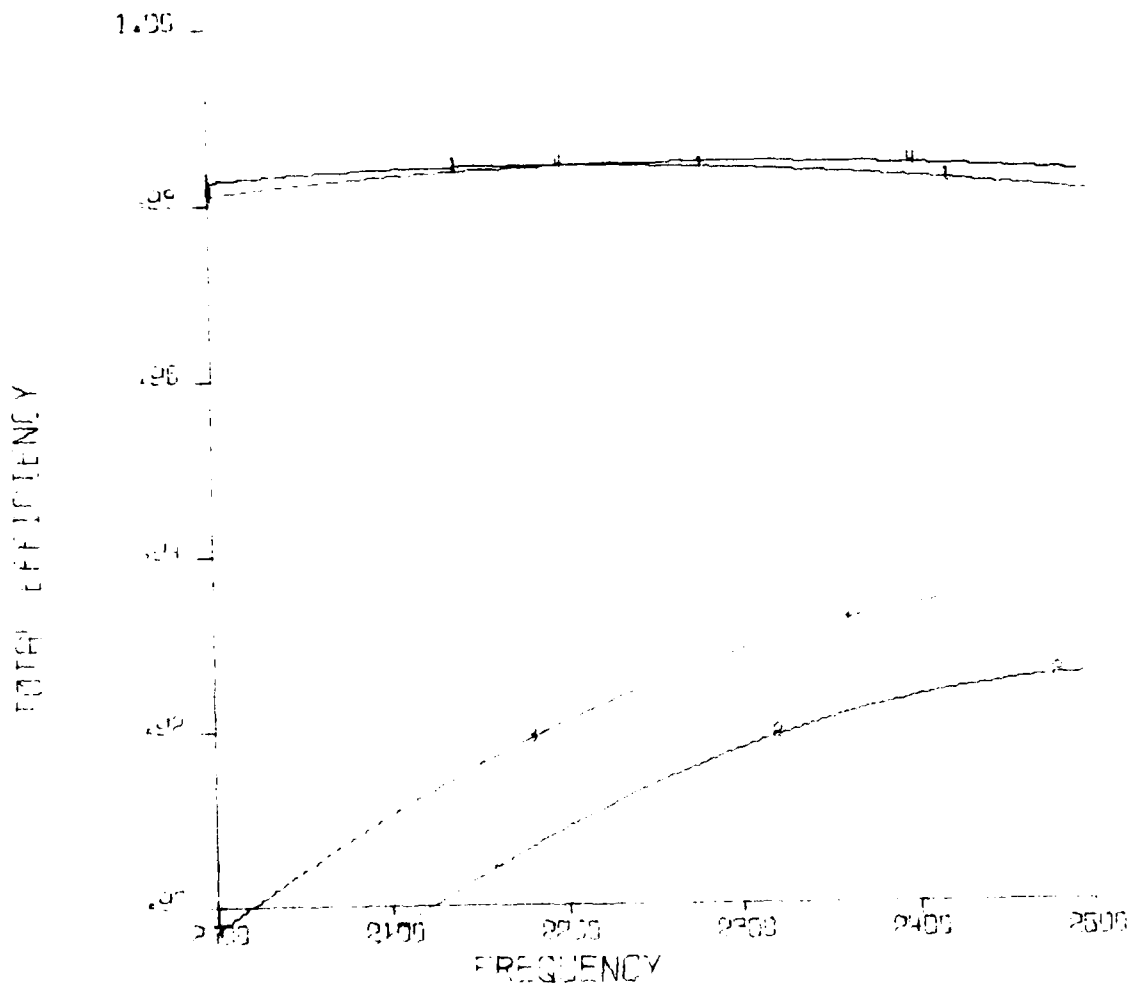
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1731 QS=E+50 LP=.7536 QP=t+50



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1	MAX FREQ	3.611318751E03+03	5.4954775E03
CURVE 1	MIN F	4.04152567E03+01	5.8332185E03
CURVE 3	MAX F	4.71313038E03+06	6.22775241E03
CURVE 4	MIN F	5.48191309E03+01	6.07796008E02
CURVE 5	FREQ	5.32052310E03+03	6.08428731E03

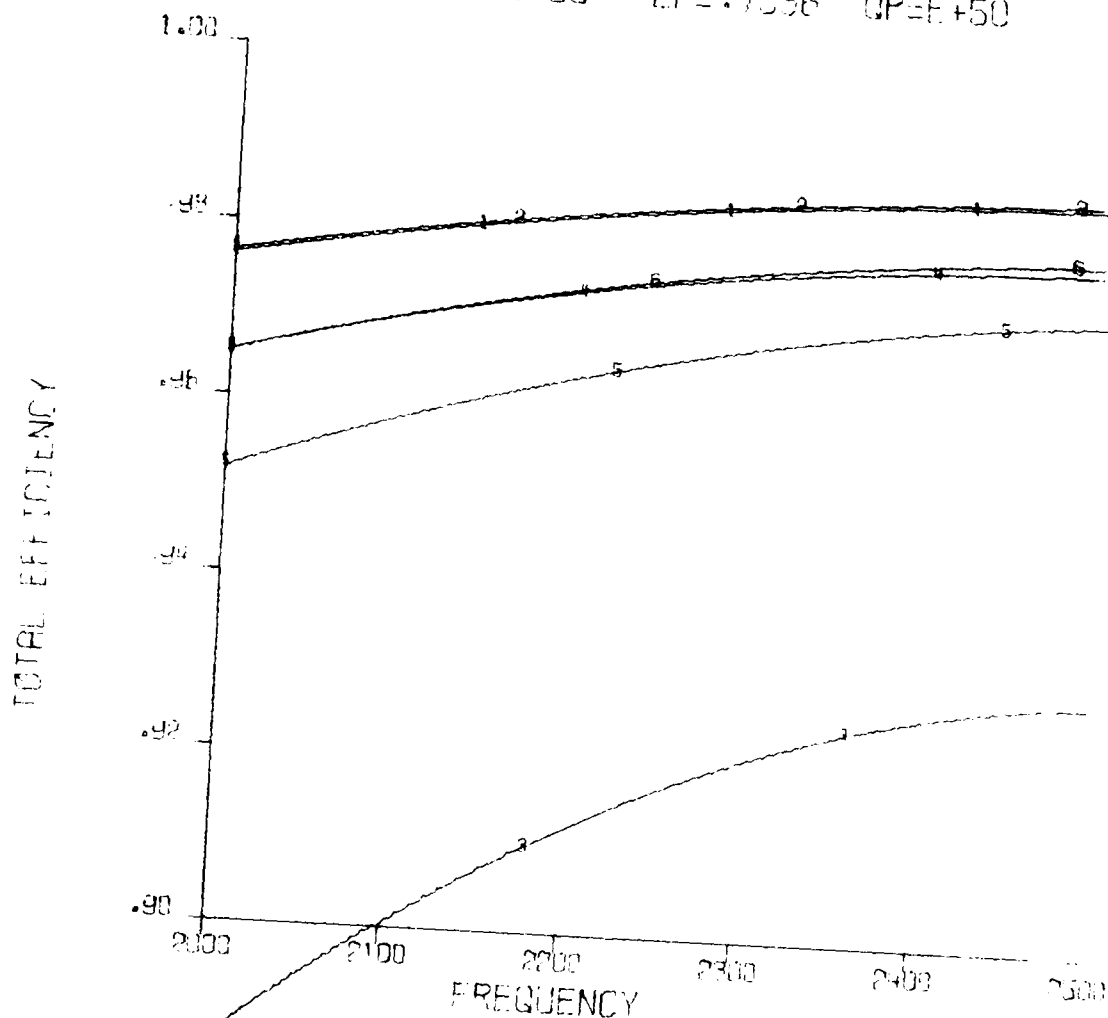
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (C.C)
 LS=.1731 CS=E+50 LP=.7536 CP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 = MAX PRES=3.08500054E04+J6.84589403E04
 CURVE 2 = MIN P =3.06205372E03+J6.15200308E03
 CURVE 3 = MIN Y =3.57300270E03+J5.19126037E03
 CURVE 4 = AVG =2.44205725E04+J4.33216357E04

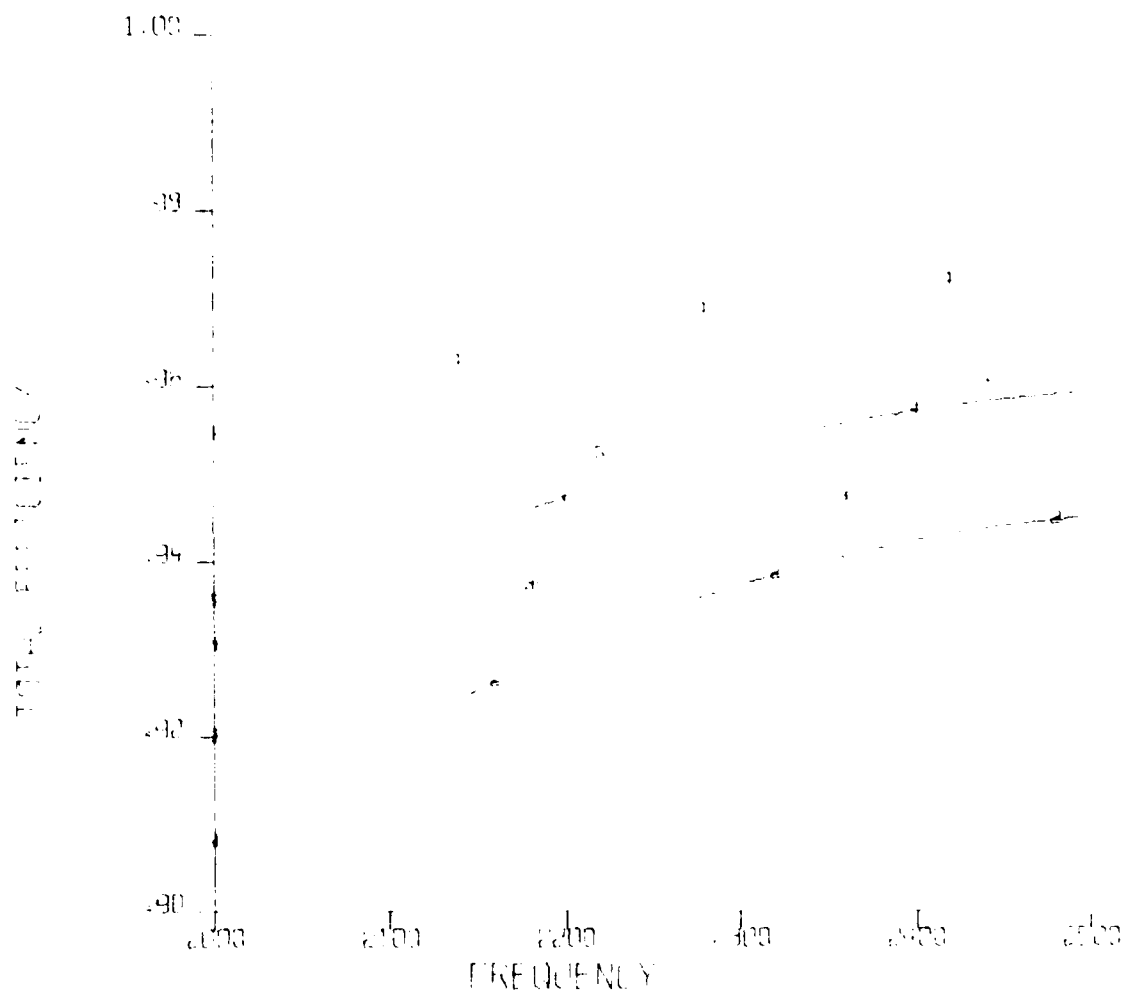
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1731 OS=E+50 LP=.7536 OP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX $PRC=1.70359401E04+J5.28297277E02$
 CURVE 2 - MAX R $=1.72759279E04+J3.19188698E03$
 CURVE 3 - MIN R $=3.18166958E03+J6.18375532E02$
 CURVE 4 - MAX Y $=1.14613751E04+J1.00632375E04$
 CURVE 5 - MIN Y $=9.09602390E03+J1.58026117E03$
 CURVE 6 - AVG $=1.14146599E04+J3.81251249E03$

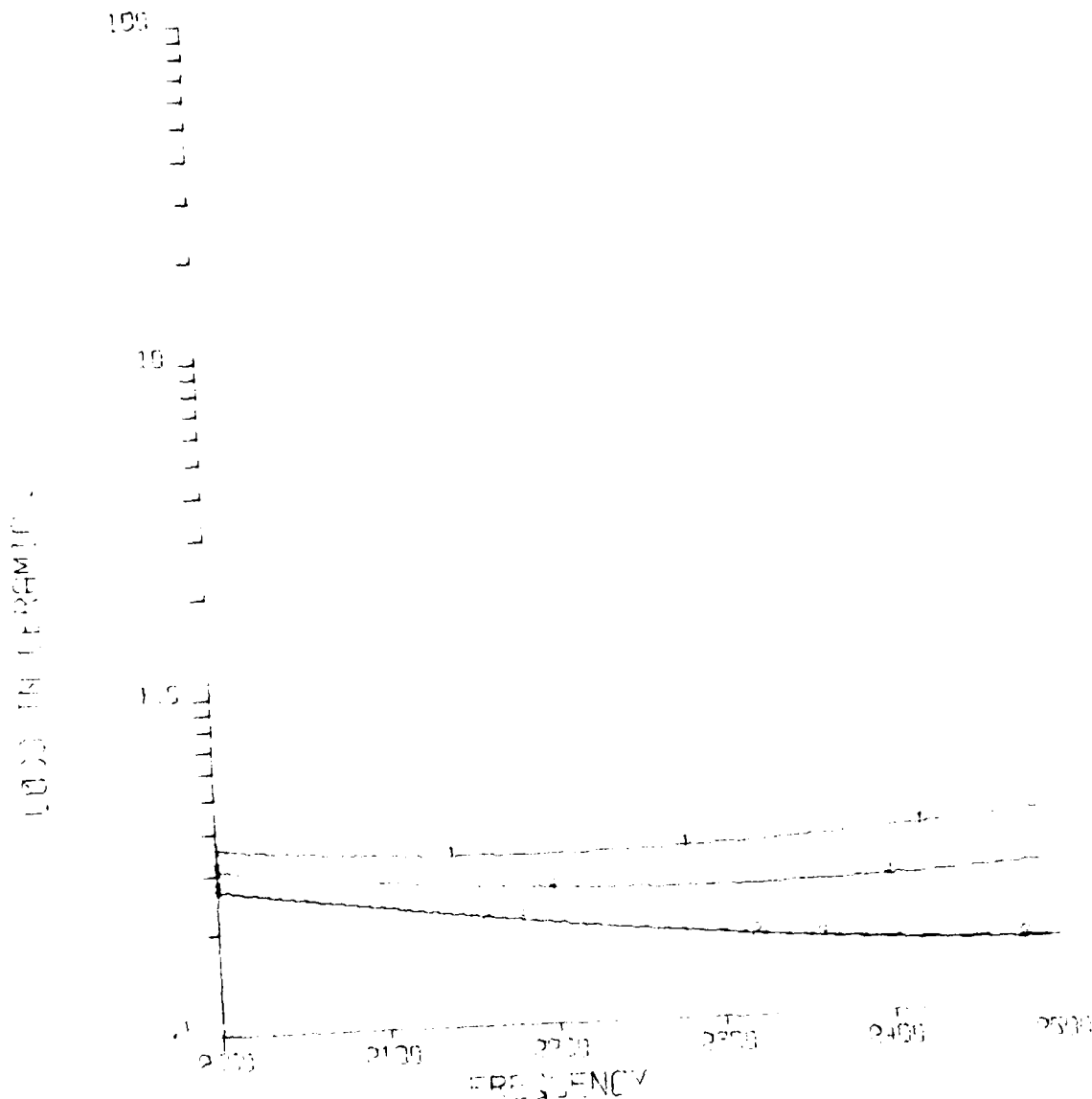
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS 1.731 05 E+50 LF 75.36 01 E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1	MAX FREQ	3.421318751E03+LS 54954.775106
CURVE 2	MIN X	4.04152567E03+LS 58332185106
CURVE 3	MAX X	6.71313035E03+LS 622775241E03
CURVE 4	MIN X	8.95191309E03+LS 67798005E02
CURVE 5	AVG	8.32052310E03+LS 68428731E03

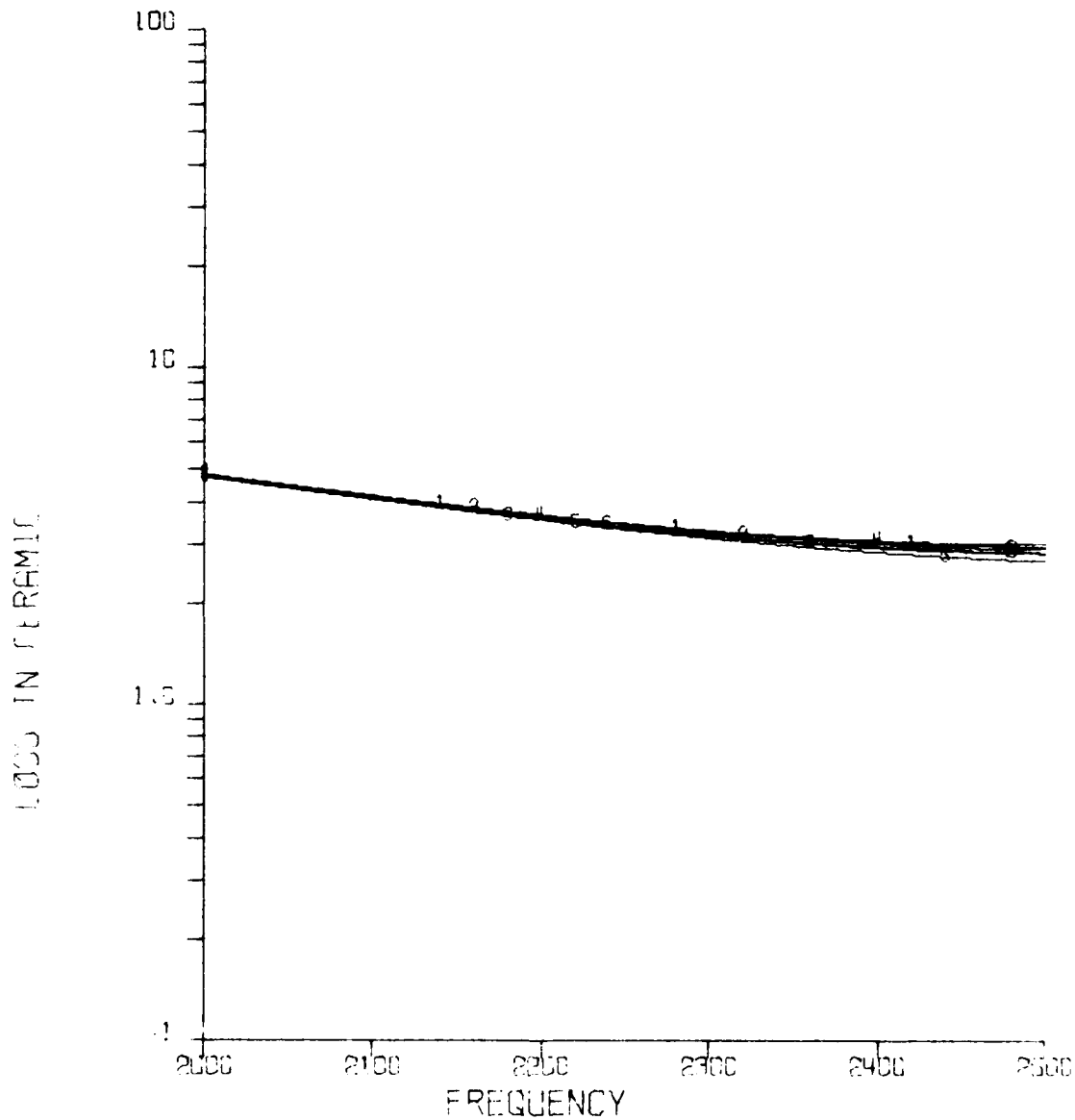
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (S.C.)
 LS=.1731 CS=1+SS LP=.7930 (7.11+5)



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PP: 5.210520054E+04+J6.81589+0.25124
 CURVE 2 - MIN P: 3.06205312E+04+J6.15220308532
 CURVE 3 - MIN X: 3.87303970E+04+J5.19126731E+03
 CURVE 4 - AVG: 3.44205315E+04+J4.23216357E+04

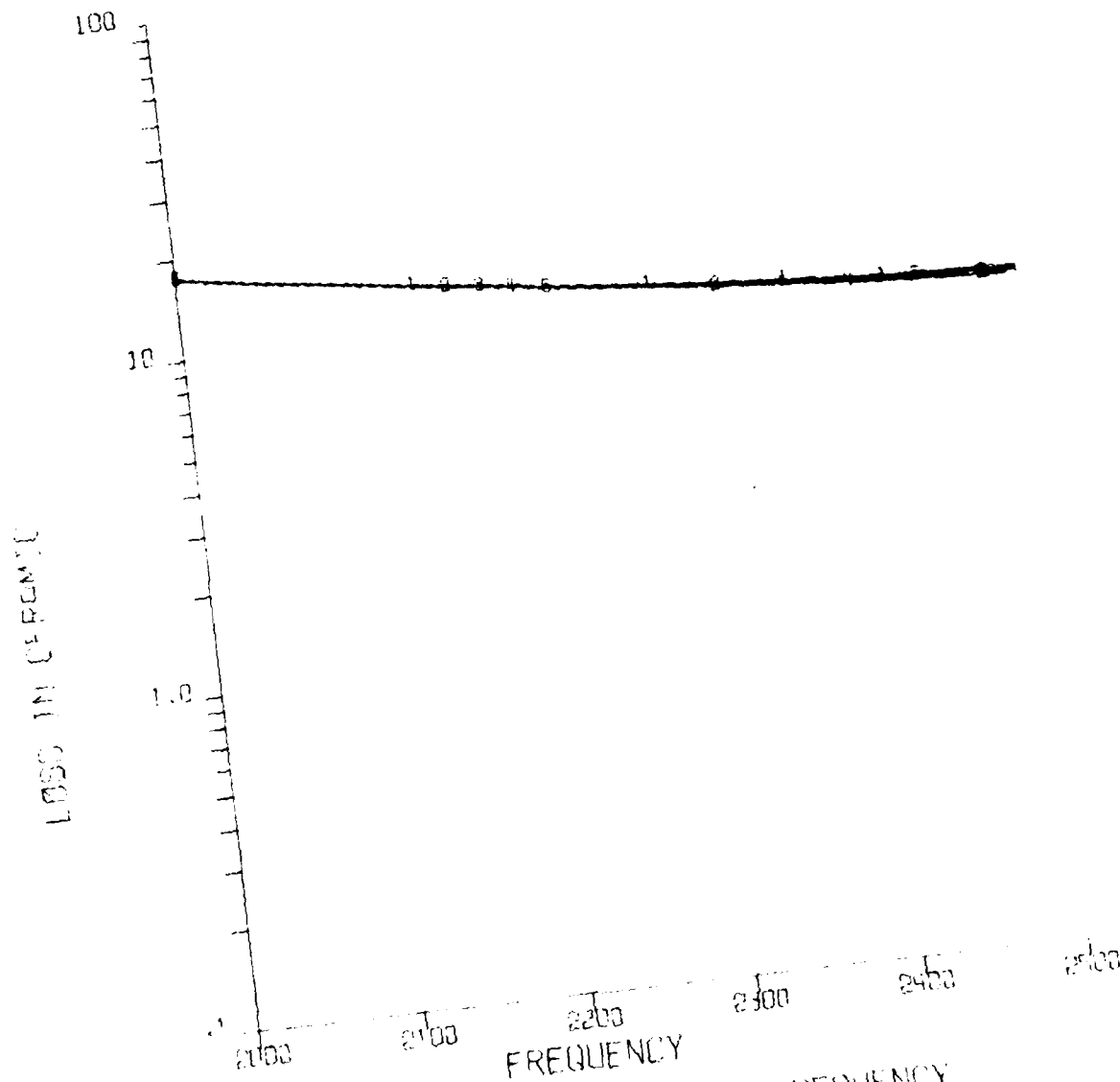
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188998E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632379E04
 CURVE 5 - MIN X =8.09602896E03-J1.58026357E03
 CURVE 6 - AVG =1.14146509E04+J3.81251049E03

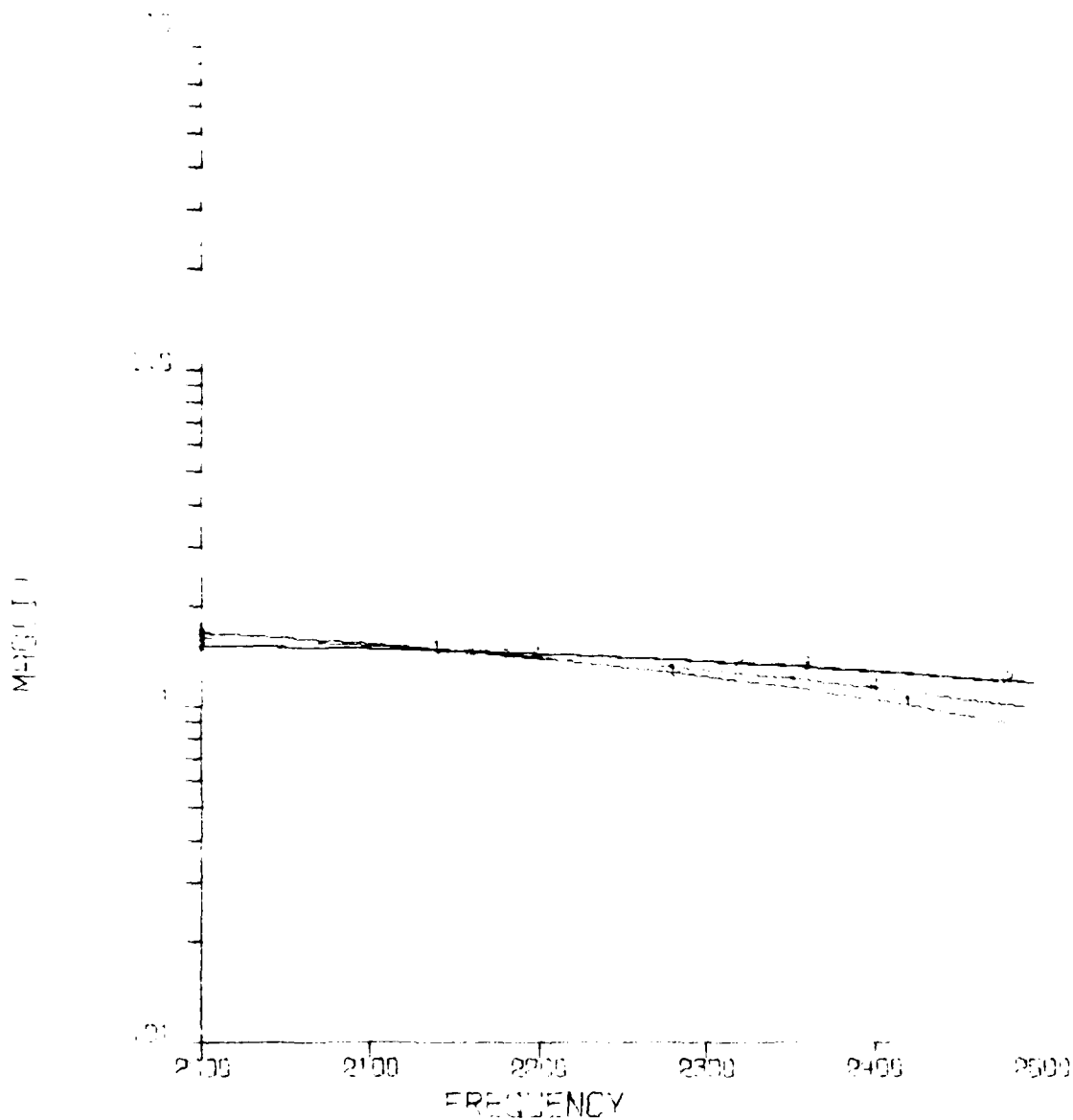
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE 10.900
 LS-1731 QS-E+50 LP 75.3E OF E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1	MAX PRES	8.62318751E03+03	5.44954775E03
CURVE 2	MIN R	4.04152567E03+01	5.8332185E03
CURVE 3	MAX X	4.71313058E03+00	2.2775241E03
CURVE 4	MIN X	5.48191309E03+01	1.07796008E02
CURVE 5	AVG	5.32062310E03+03	0.5423731E03

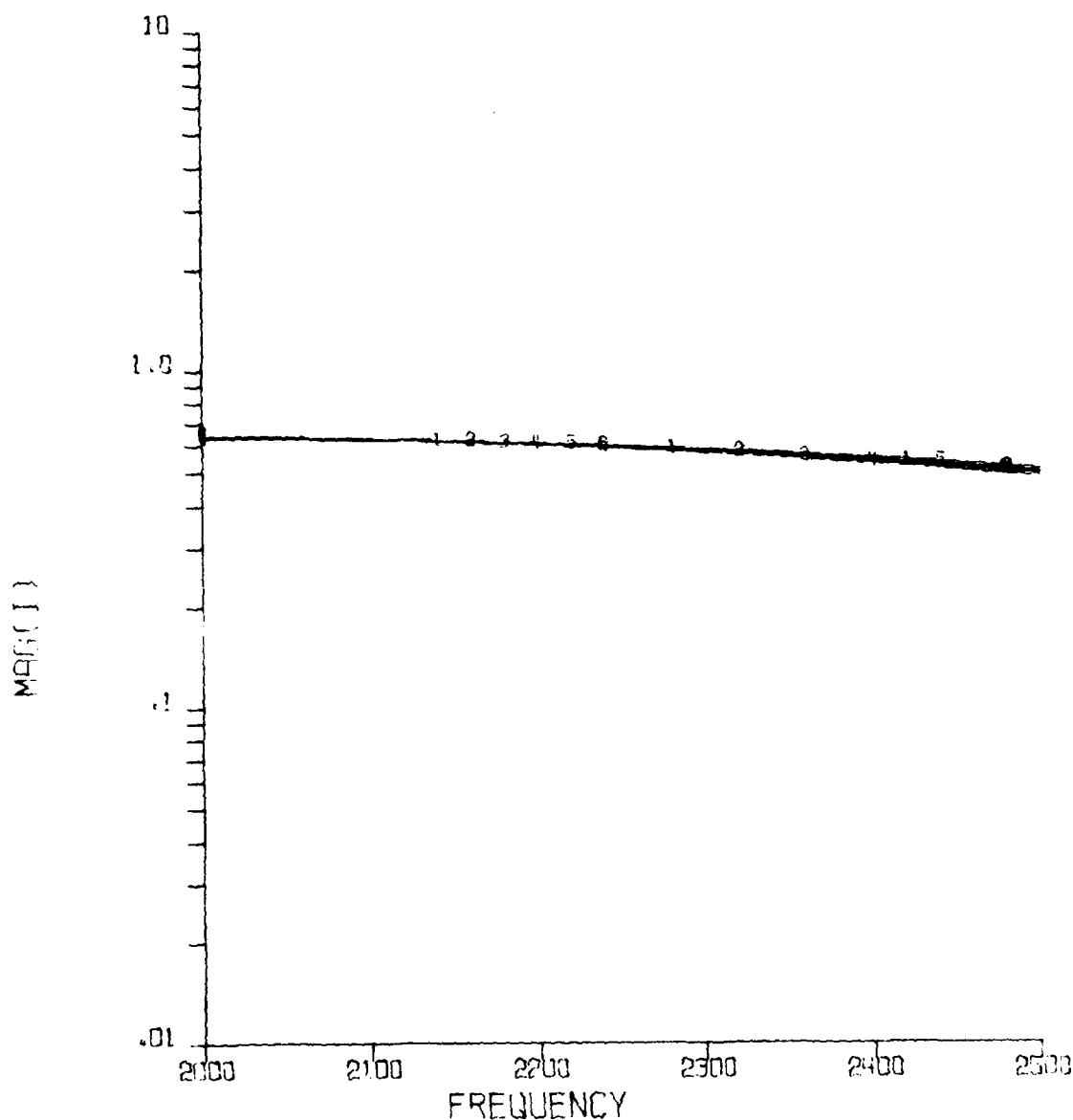
FINAL DESIGN OF 1144113N-1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (C,C)
 LS=.1731 CS=E+50 LP=.7536 QP=E+50



MAGNITUDE VERSUS FREQUENCY

CURVE 1 - MAX P_{LOSS} = $2.08590054504 + j6.84589403504$
 CURVE 2 - MIN P_{LOSS} = $2.06295312503 + j6.15200308502$
 CURVE 3 - MIN X_{LOSS} = $2.07300970503 + j5.19126031003$
 CURVE 4 - AVG_{LOSS} = $2.14420570504 + j4.83216357004$

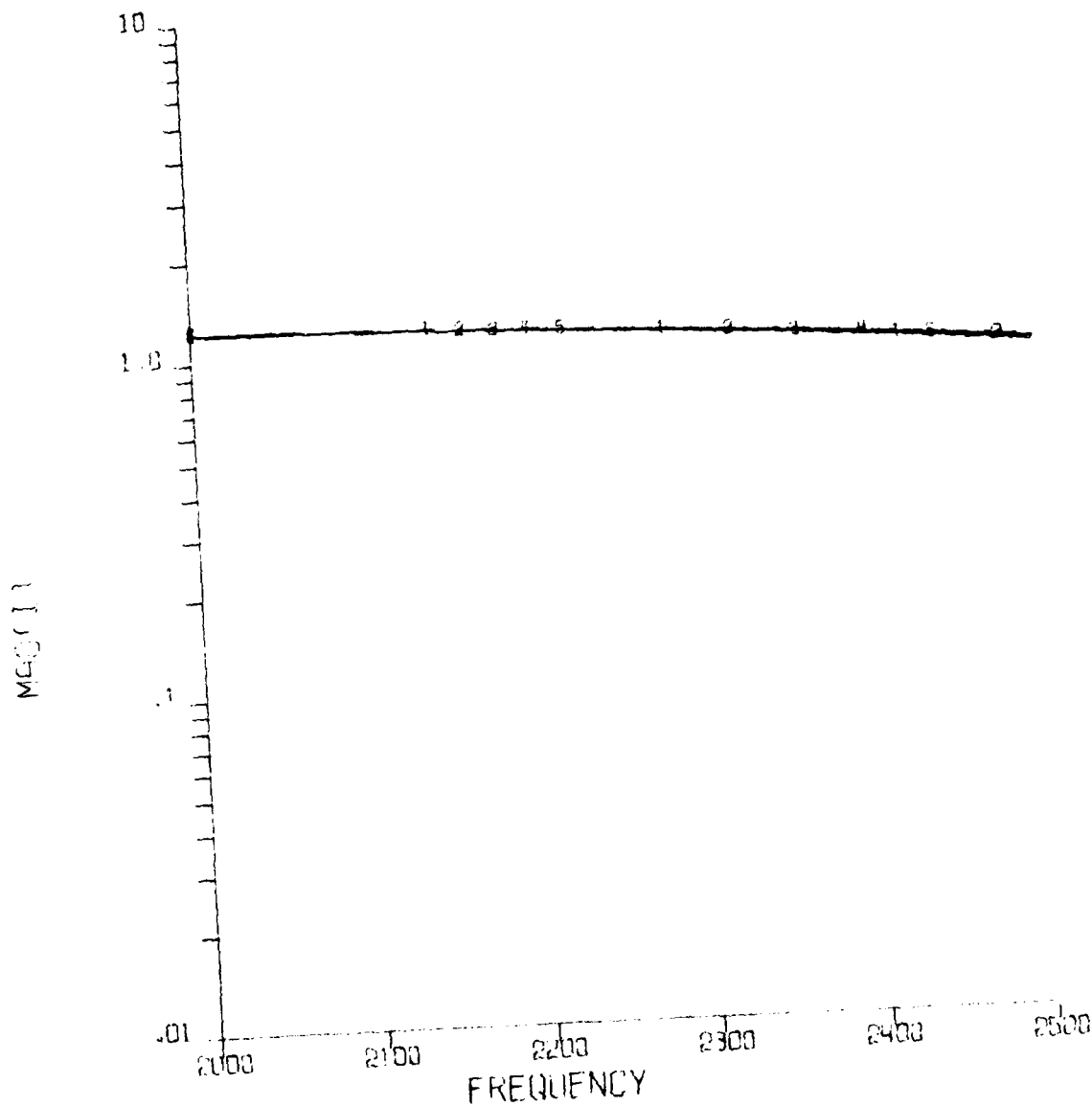
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0.30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70359401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188898E03
 CURVE 3 - MIN R =3.18166958E03+J6.18375532E03
 CURVE 4 - MAX X =1.14610751E04+J1.00632375E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026357E03
 CURVE 6 - AVG =1.14146599E04+J3.81251049E03

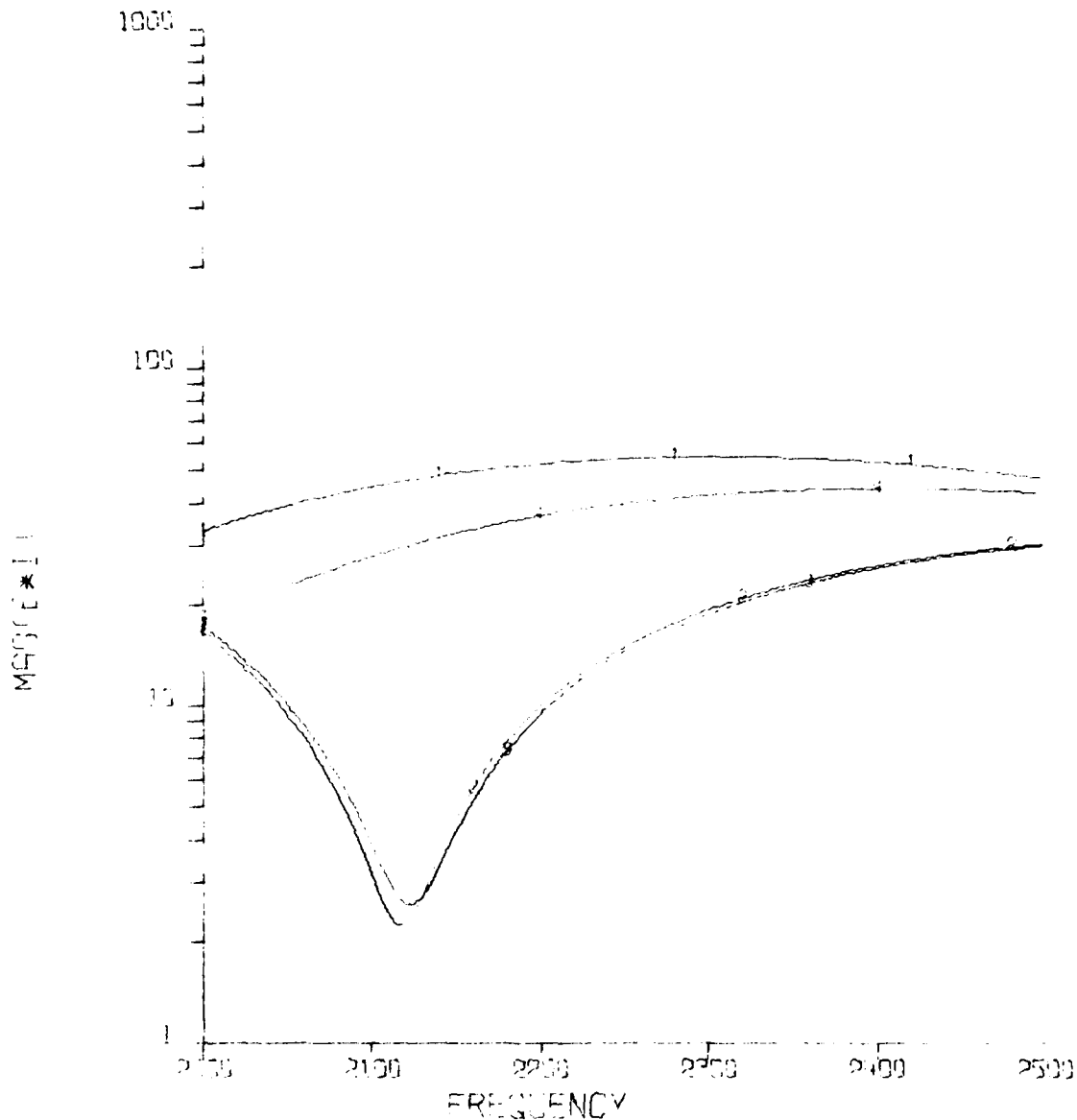
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS=.1731 QS=t+50 LP=.7536 QP=t+50



MAG(1) VERSUS FREQUENCY

CURVE 1	MAX PRES	8.62318751E03+03	54954775E03
CURVE 2	MIN R	4.04152567E03+01	58332185E03
CURVE 3	MAX X	4.71313038E03+08	22775241E03
CURVE 4	MIN X	5.48191309E03-01	07796008E02
CURVE 5	HVC	5.32082810E03+03	08423731E03

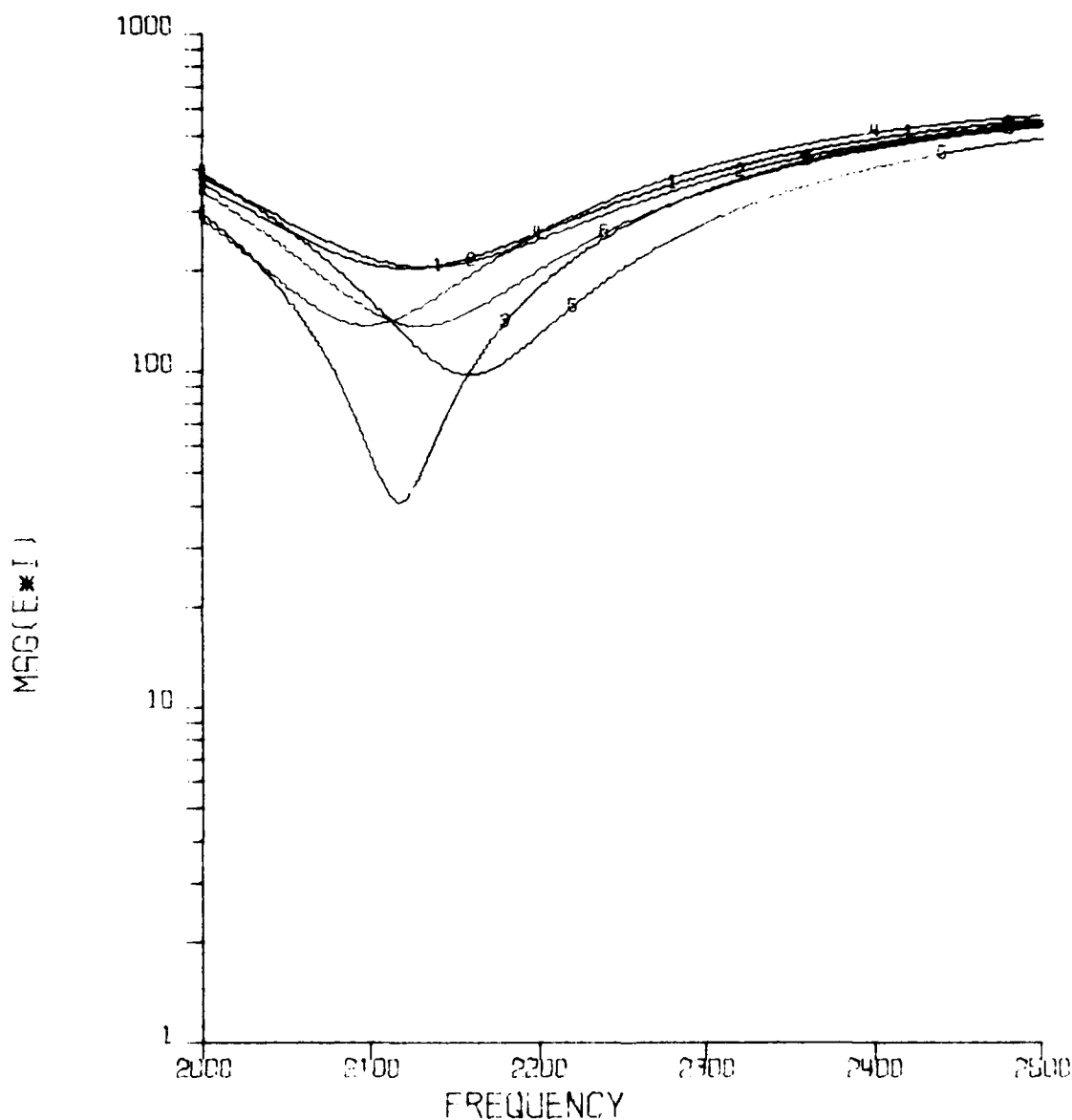
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND ENDFIRE (O,C)
 LS=.1731 GS=E+50 LP=.7536 QP=E+50



MAGNITUDE VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.08590054E04+J6.84589403E04
 CURVE 2 - MIN P =3.06295372E03+J6.15220308E03
 CURVE 3 - MIN X =3.57300970E03+J5.19126037E03
 CURVE 4 - AVG =2.44205725E04+J4.33216257E04

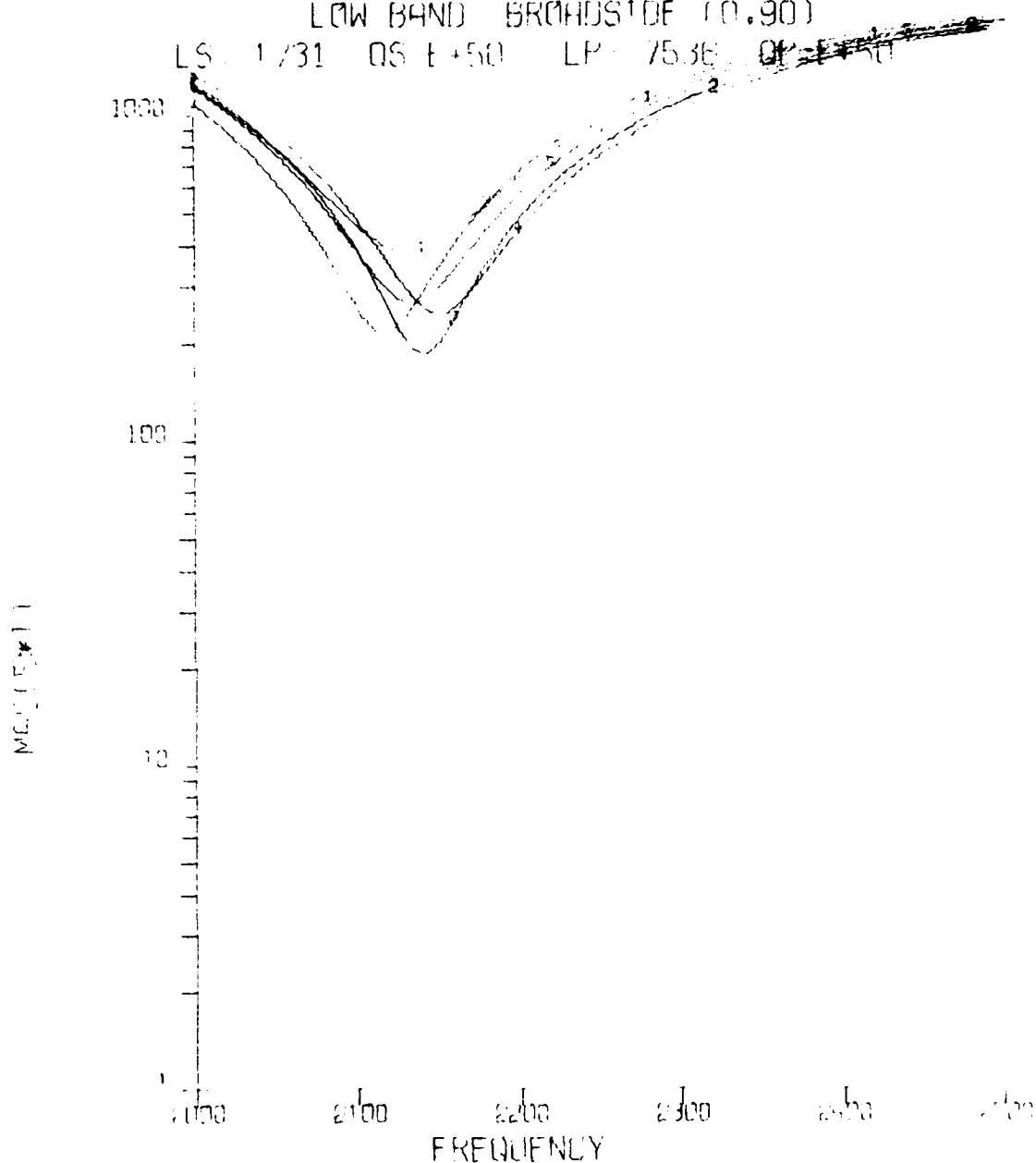
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 30 DEGREE (0,30)
 LS=.1731 QS=E+50 LP=.7536 QP=E+50



MAG(E*I) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.70358401E04+J5.28297277E03
 CURVE 2 - MAX R =1.72759279E04+J3.19188899E03
 CURVE 3 - MIN R =3.18166958E03+J6.18379532E03
 CURVE 4 - MAX X =1.14610791E04+J1.00632379E04
 CURVE 5 - MIN X =8.09602996E03-J1.58026397E03
 CURVE 6 - AVC =1.14146599E04+J3.81251049E03

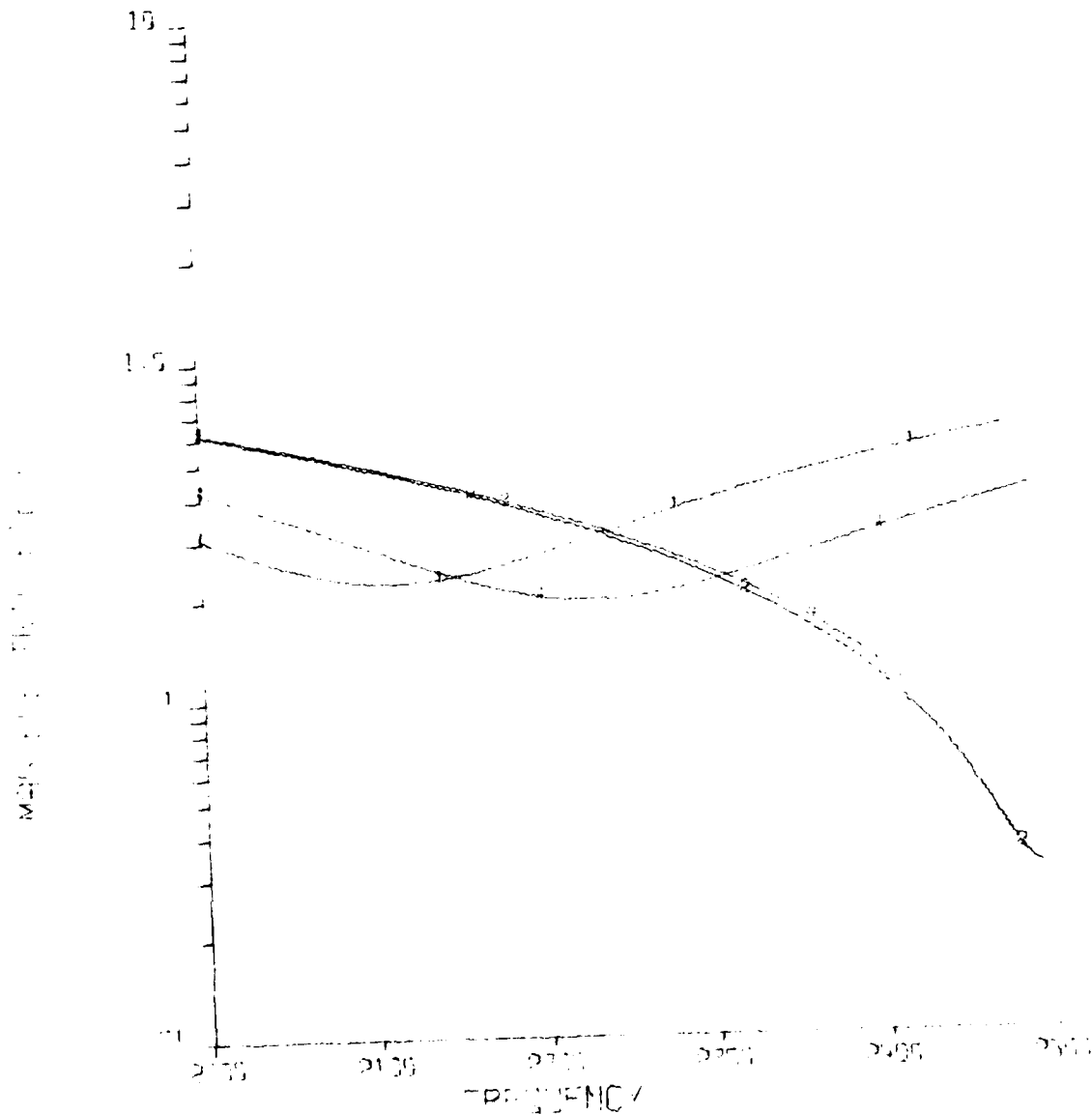
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADCAST (0.90)
 LS: 1/31 OS: E+50 LP: 75.36 OF: E+50



MAG (dB) VERSUS FREQUENCY

CURVE 1	MAX PRES	3.62318751E03+03	1.495477E03
CURVE 2	MIN R	4.041525E03+01	5.32155E03
CURVE 3	MAX X	4.71313038E03+00	2.775791E03
CURVE 4	MIN X	5.483191309E03+01	7.79E03E03
CURVE 5	Avg	5.32082310E03+03	0.542313E03

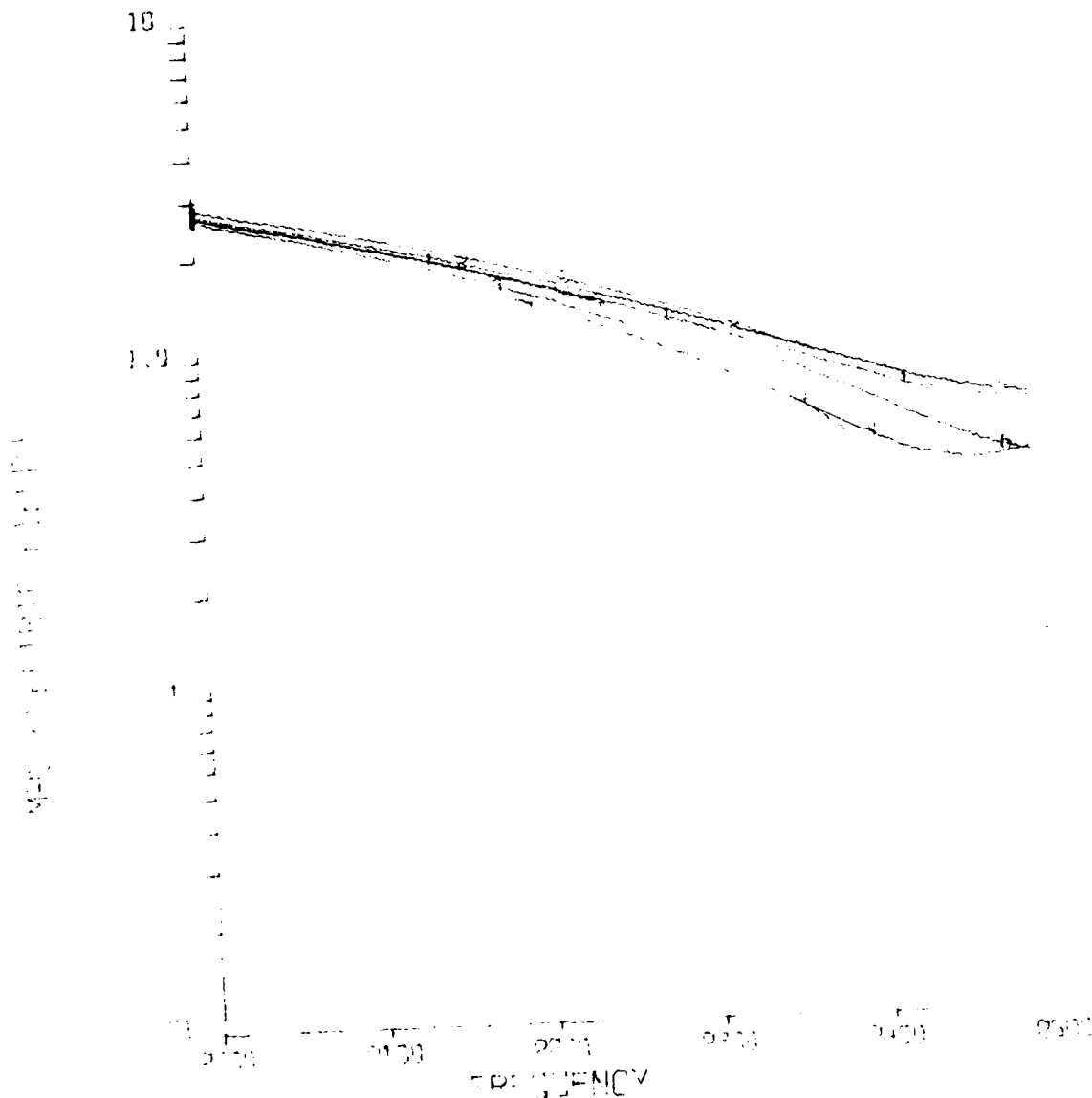
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND END FIRE (S.C.)
 LS=17.1 CS=6.50 LPE=7530 QP=1.50



MAGNETRIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX P (S) 2.0850054E+04 16.91589 0.25 14
 CURVE 2 - MIN P 1.3062052E+04 16.1522 13.125 12
 CURVE 3 - MIN Y 1.5700097E+04 15.1912602 11.12
 CURVE 4 - AVG 1.4121570E+04 14.2216247 10

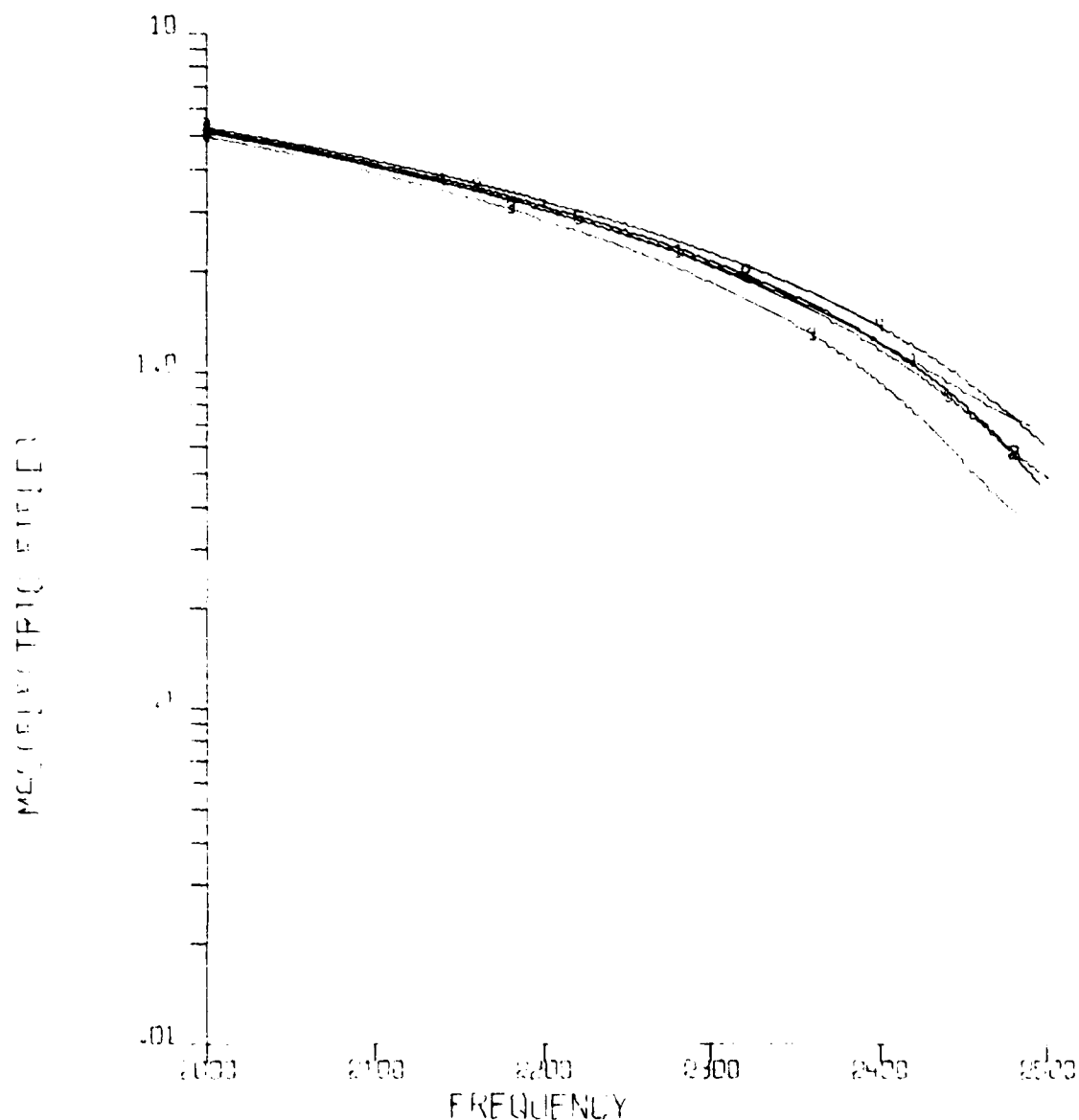
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND 35 DEGREE (0.30)
 LS=1.721 CS=1.50 LP=1.7026 CP=1.50



MAGNITUDE OF FIELD IN VAPOLS FREQUENCY

CLP=1	MCV	PP=1	1.72250E+01	15.2300E+00
CLP=2	MCV	P	1.72250E+01	15.2300E+00
CLP=3	MIN	P	1.72250E+01	15.2300E+00
CLP=4	MCV	V	1.72250E+01	15.2300E+00
CLP=5	MIN	V	1.72250E+01	15.2300E+00
CLP=6	PP		1.72250E+01	15.2300E+00

FINAL DESIGN OF ITERATION 1
 C/P. 1.1 5 INCH CIRCULAR HEAD
 LOW BAND BROADSIDE (0.90)
 LS = 1731 OS = +50 LP = 7536 OP = +50



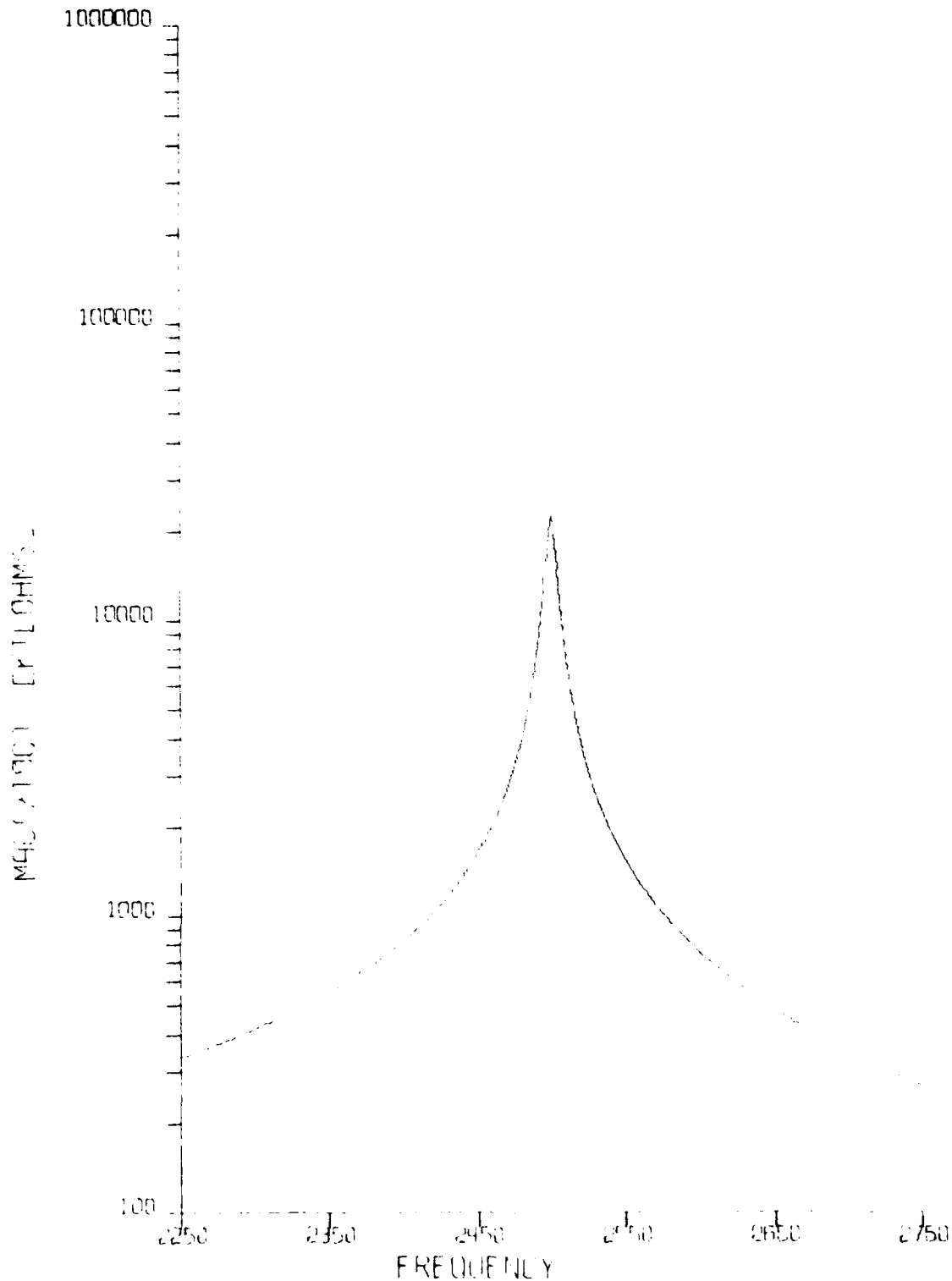
MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1	MAX FRES	3.62318751E03+J3.54954775E03
CURVE 2	MIN R	4.04152567E03+J1.58332185E03
CURVE 3	MAX X	4.71313035E03+J6.22775241E03
CURVE 4	MIN X	5.48191309E03-J1.07790005E03
CURVE 5	AVG	5.92052310E03+J3.05423131E03

TRACOR, INC.

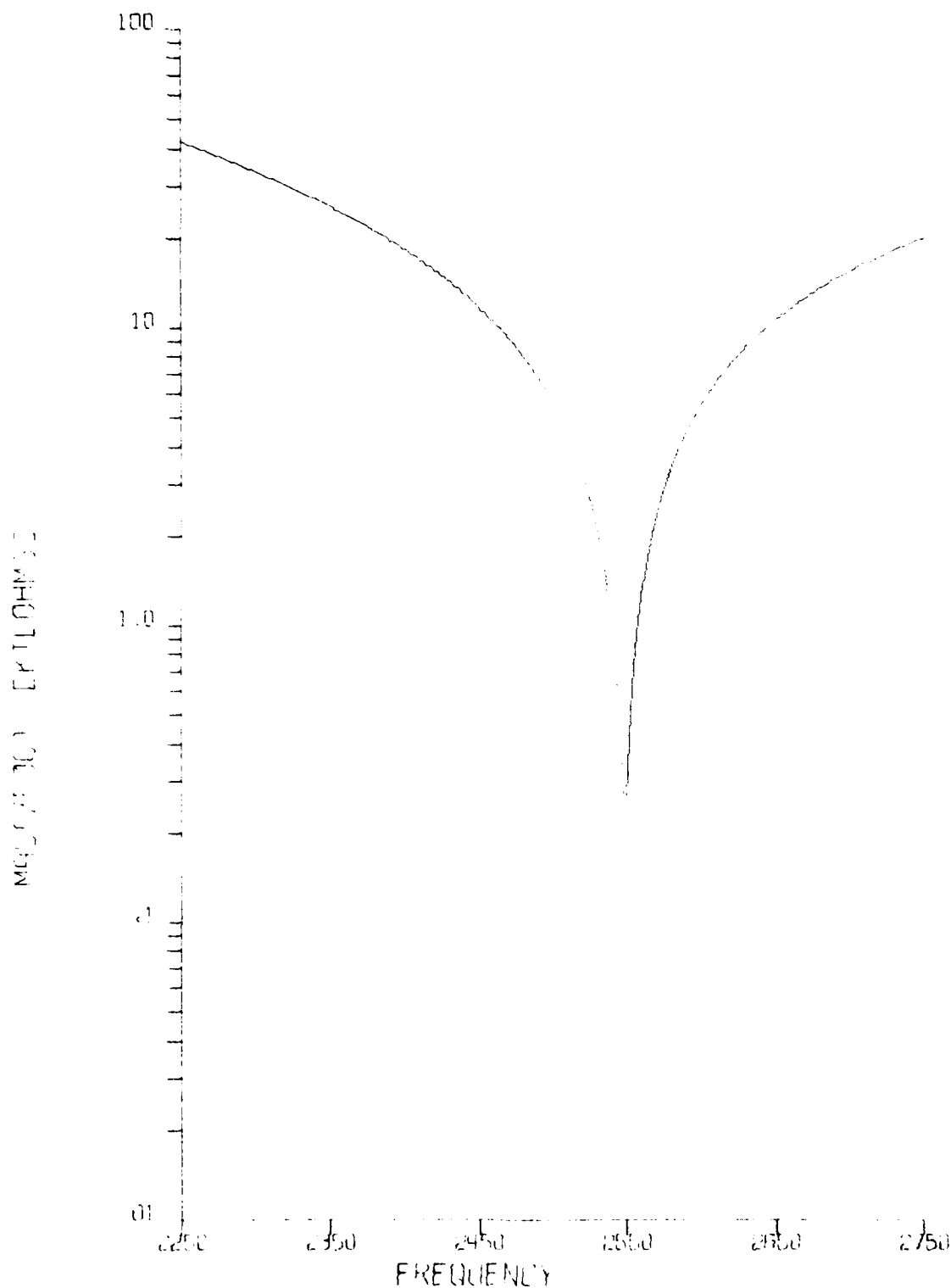
MID BAND

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND
 LP=-.4851 QP=E+50



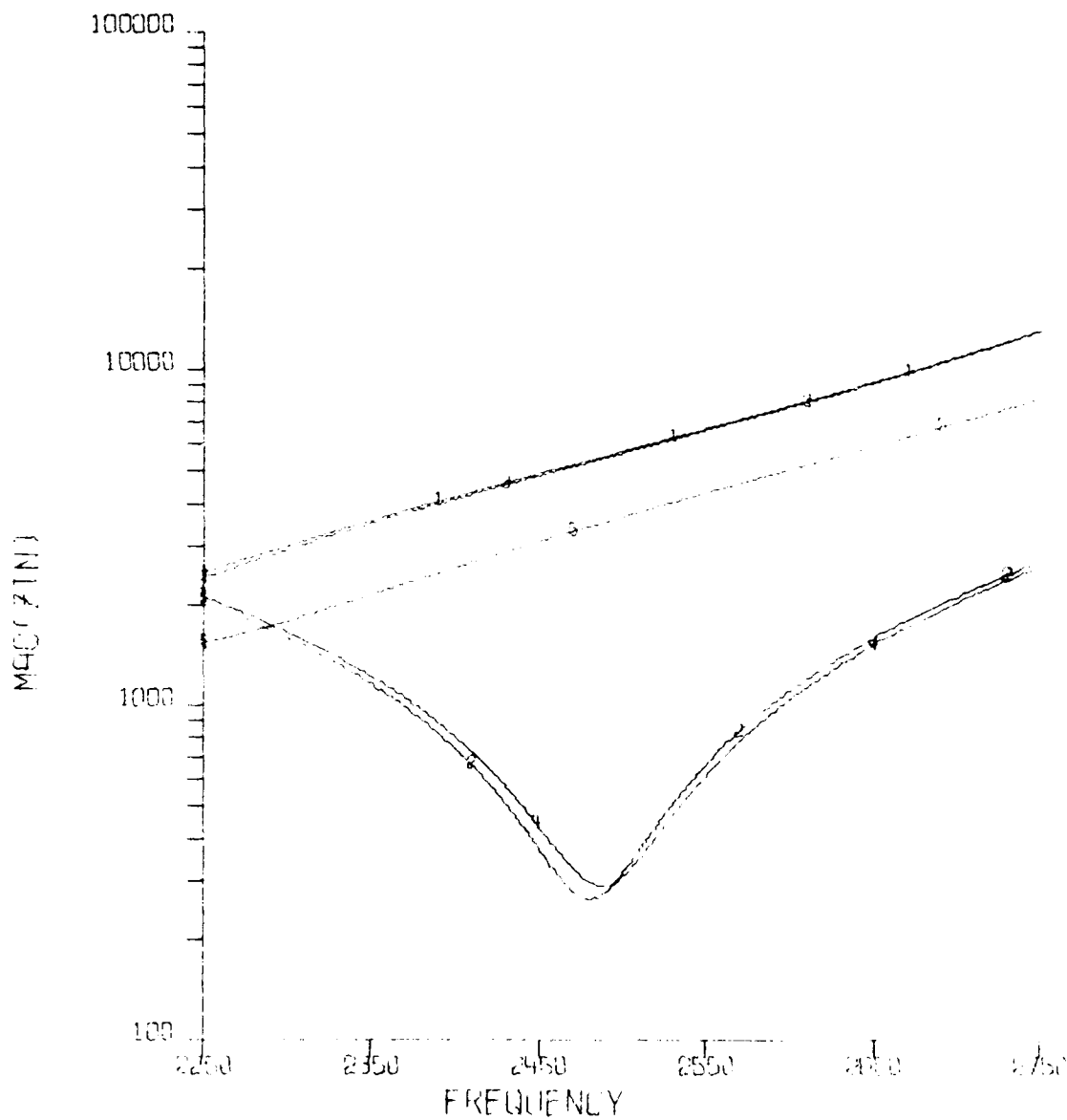
MAGNITUDE VERSUS FREQUENCY

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND
 $LP = .4851$ $QP = E+50$



MAGNITUDE VERSUS FREQUENCY

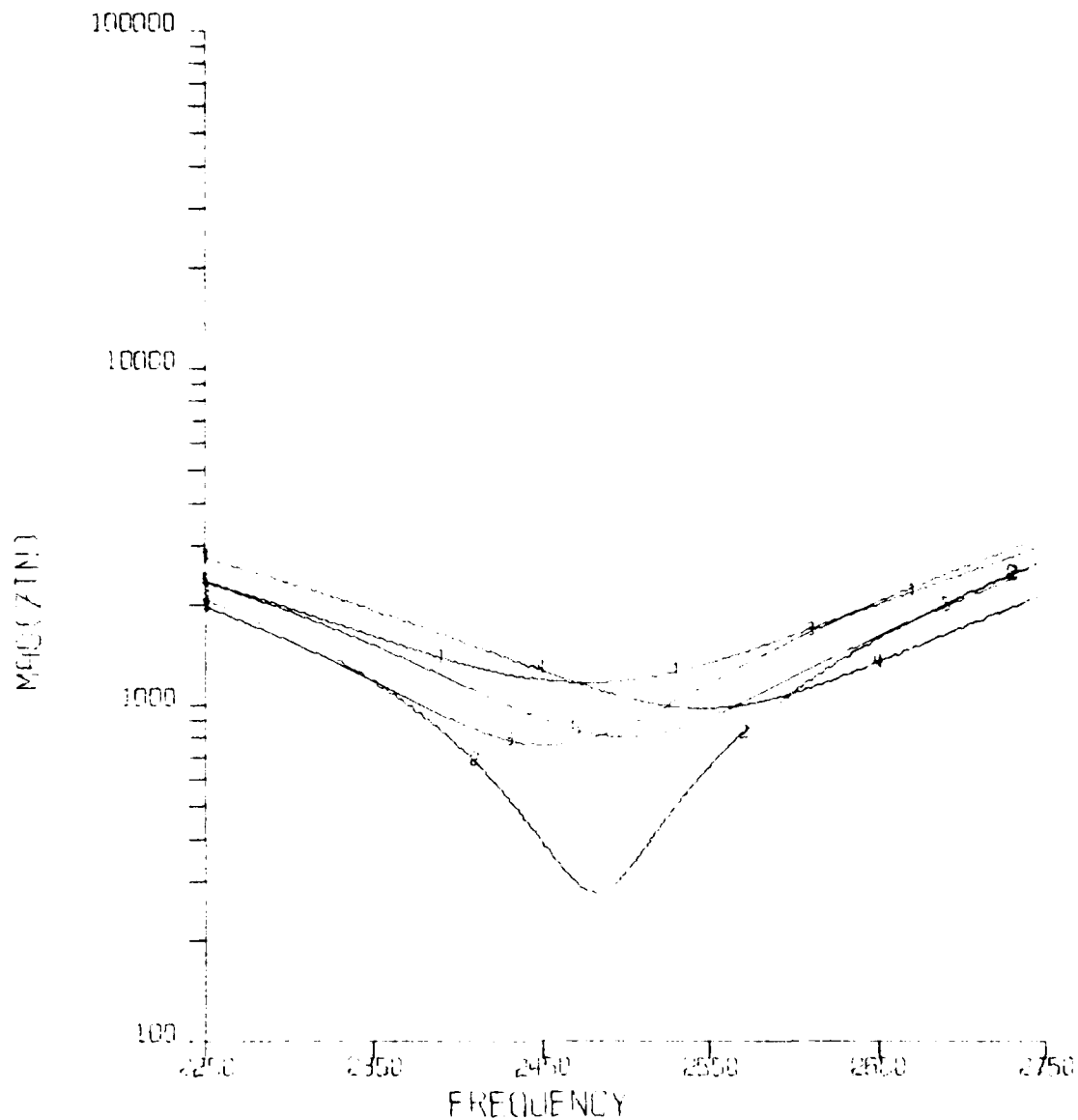
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4851 QP=E+50



MAG(ZIN) VERSUS FREQUENCY

CURVE 1	MAX PRES	3.70039404E+04	12.6032321E+04
CURVE 2	MIN R	3.43342781E+03	12.81500304E+03
CURVE 3	MAX X	3.43145191E+04	12.70014372E+04
CURVE 4	MIN X	3.30512498E+03	12.91990761E+03
CURVE 5	AVG	3.31536341E+04	12.53019094E+04

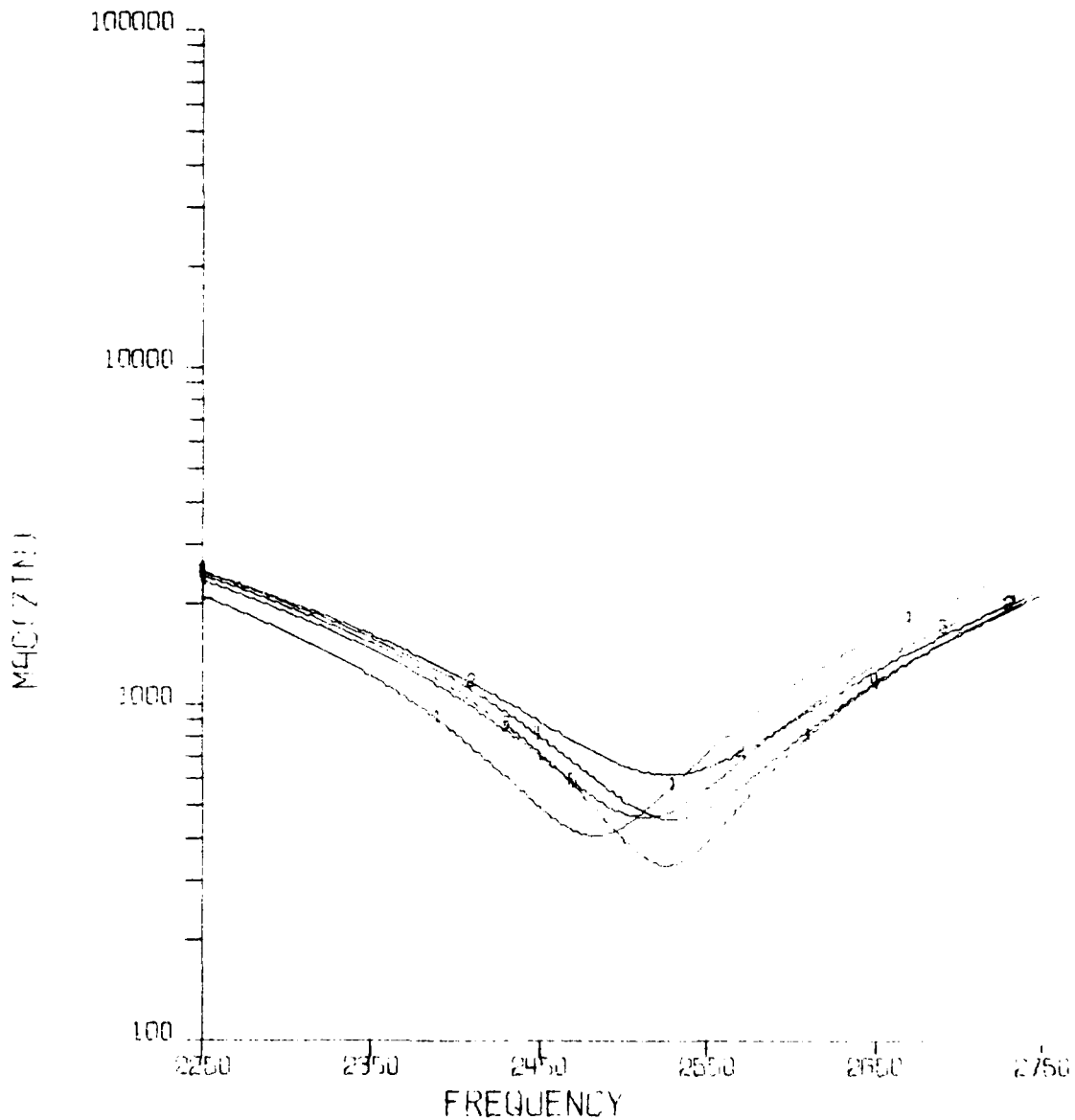
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4851 OP=E+50



MAG(Z IN) VERSUS FREQUENCY

CURVE 1 - MAX PRES = 1.701347804E 04 + J6.64038637E 03
 CURVE 2 - MIN R = 3.6613911E 03 + J7.66241486E 03
 CURVE 3 - MAX X = 1.07609438E 04 + J1.06836049E 04
 CURVE 4 - MIN X = 1.28174594E 04 - J9.95386341E 03
 CURVE 5 - AVG = 1.09357651E 04 + J4.33621119E 03

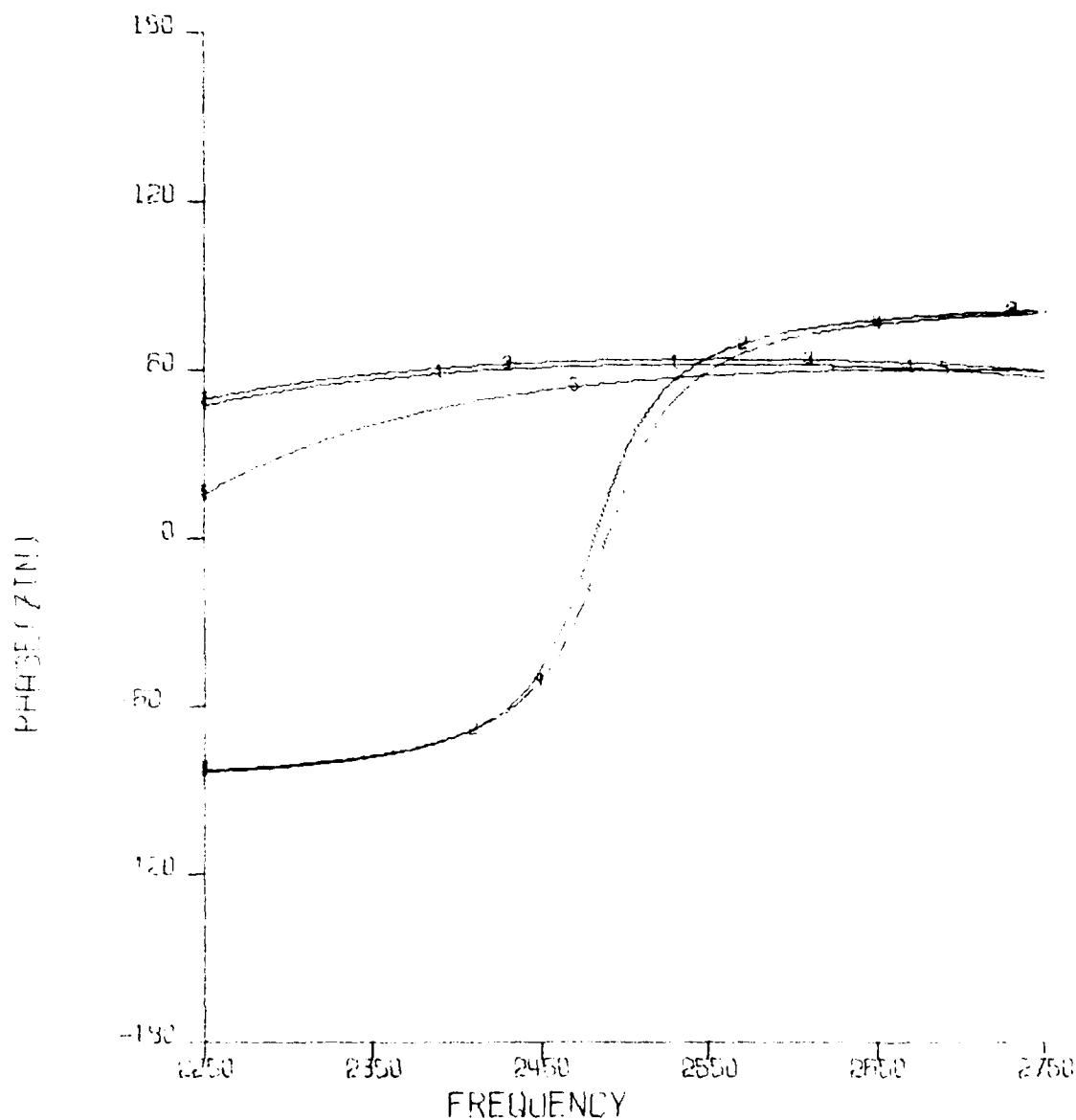
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0,90)
 LP=.4851 QP=E+50



MAGI ZIN VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.50801644E03+J7.43469919E03
 CURVE 2 - MAX R -8.18015867E03+J1.20764574E03
 CURVE 3 - MIN R -4.27851865E03+J0.38239074E03
 CURVE 4 - MIN X -5.34411695E03+J1.80753326E03
 CURVE 5 - AVG -0.13526911E03+J3.81425445E03

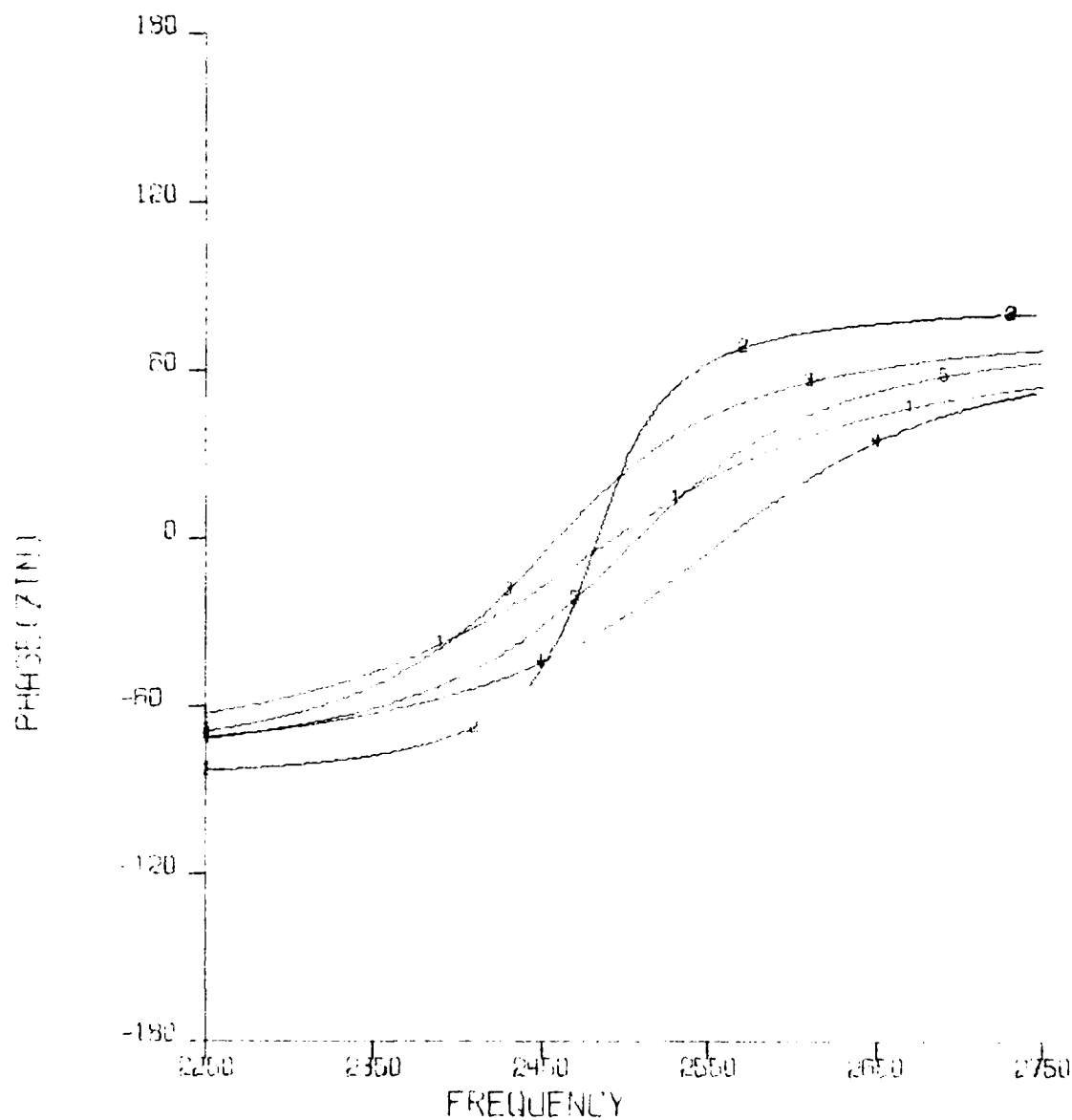
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=.4851 QP=E+50



PHASE(Z IN) VERSUS FREQUENCY

CURVE 1	- MAX	PRES=	3.70694046E04+J7.66828215E04
CURVE 2	- MIN	R	-3.48842781E03+J7.81806304E03
CURVE 3	- MAX	X	-3.43145191E04+J7.70014372E04
CURVE 4	- MIN	X	-3.80512498E03+J6.91990765E03
CURVE 5	- AVG		-2.81596841E04+J4.83015054E04

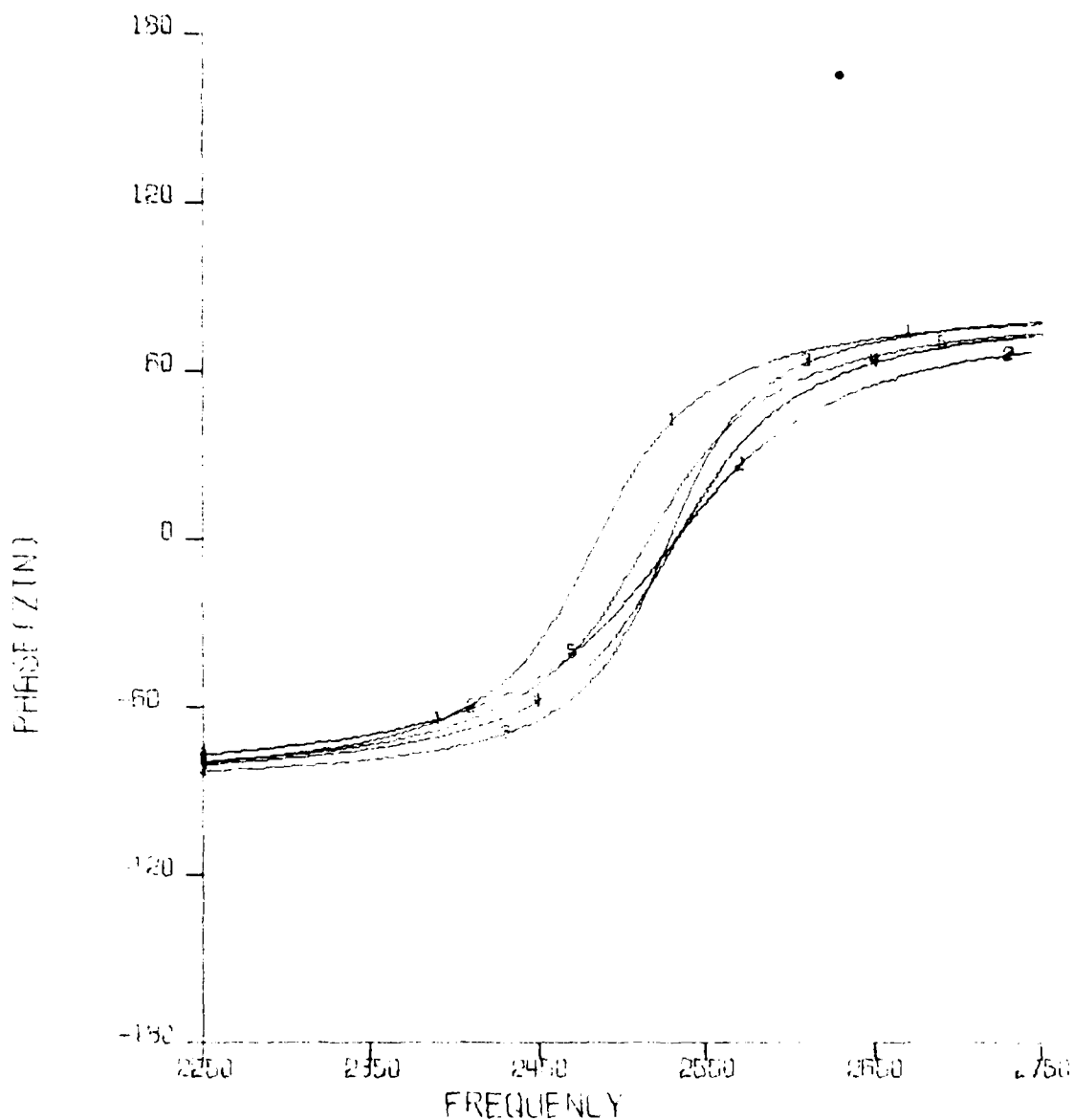
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0,30)
 LP=.4851 QP=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 - MAX PRES=1.81847804E04+J16.64038697E03
 CURVE 2 - MIN R =3.80139341E03+J7.60241486E03
 CURVE 3 - MAX X =1.07609438E04+J1.00836049E04
 CURVE 4 - MIN X =1.28174594E04-J9.95386351E02
 CURVE 5 - AVG =1.09357861E04+J4.93621119E03

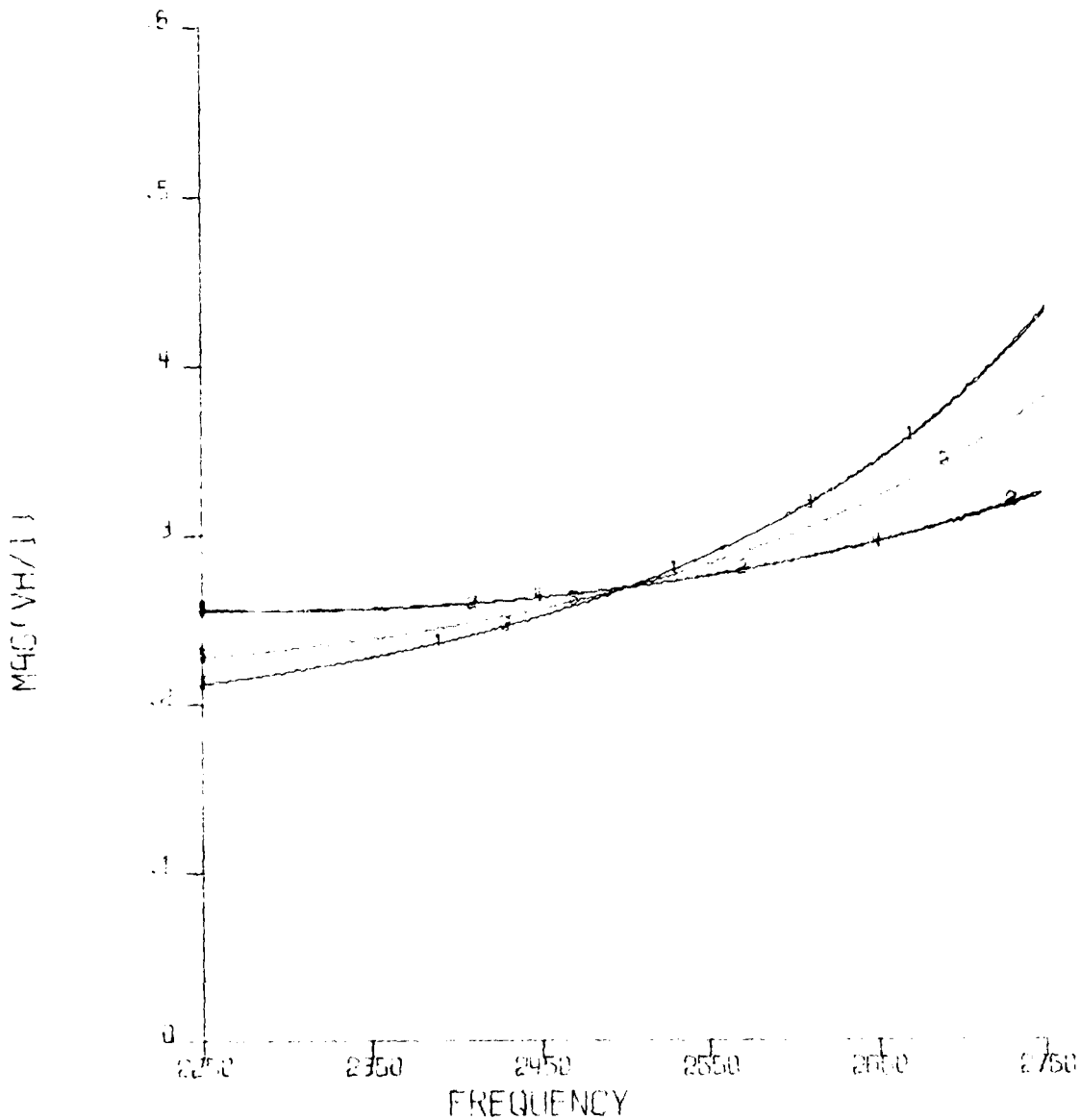
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4851 QP=E+50



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1	- MAX PRES	-5.50801644E03+J7.43469919E03
CURVE 2	- MAX R	-8.18015867E03+J1.90754474E03
CURVE 3	- MIN R	-4.27851865E03+J2.38239074E03
CURVE 4	- MIN X	-5.94411695E03+J1.82753326E03
CURVE 5	- AVG	-6.13576911E03+J3.81425444E03

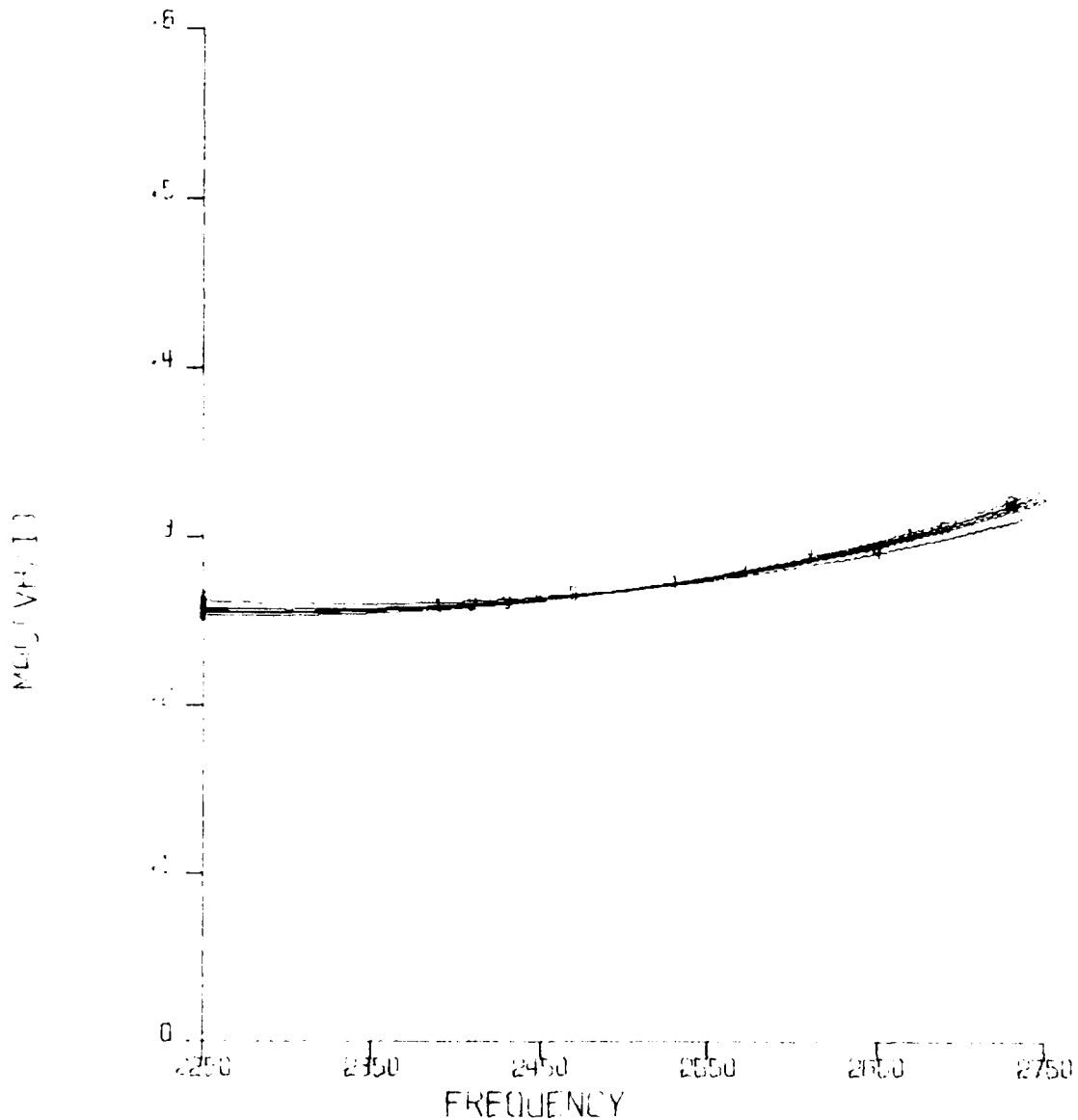
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP-4851 QP-E+50



MAG (VH/1) VERSUS FREQUENCY

CURVE 1	MAX PRES	$3.70894046E04 + j7.66328215E04$
CURVE 2	MIN R	$-3.43842781E03 + j7.81806304E03$
CURVE 3	MAX X	$-3.43145191E04 + j7.70014372E04$
CURVE 4	MIN X	$3.80512498E03 + j0.91990765E03$
CURVE 5	AVG	$2.81596841E04 + j4.733015054E04$

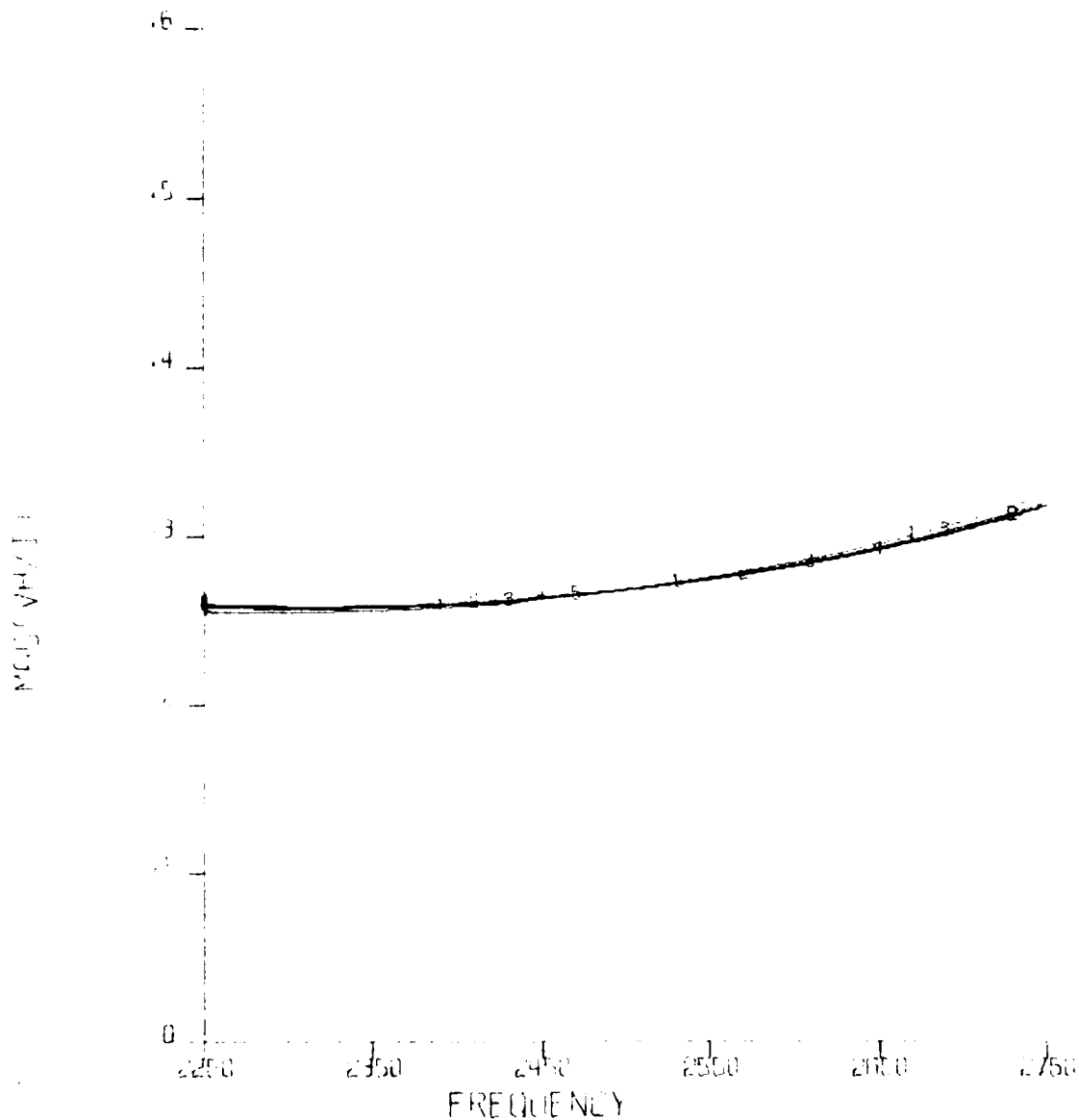
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=4851 QP=450



MAG |VH/I| VERSUS FREQUENCY

CURVE 1	MAX PRES	1.781847804E04+J6.464038697E03
CURVE 2	MIN R	-3.780139341E03+J2.766241458E03
CURVE 3	MAX X	-1.207609438E04+J1.06836049E04
CURVE 4	MIN X	-1.28174594E04-J9.95386341E02
CURVE 5	RVS	1.209357851E04+J4.93621119E03

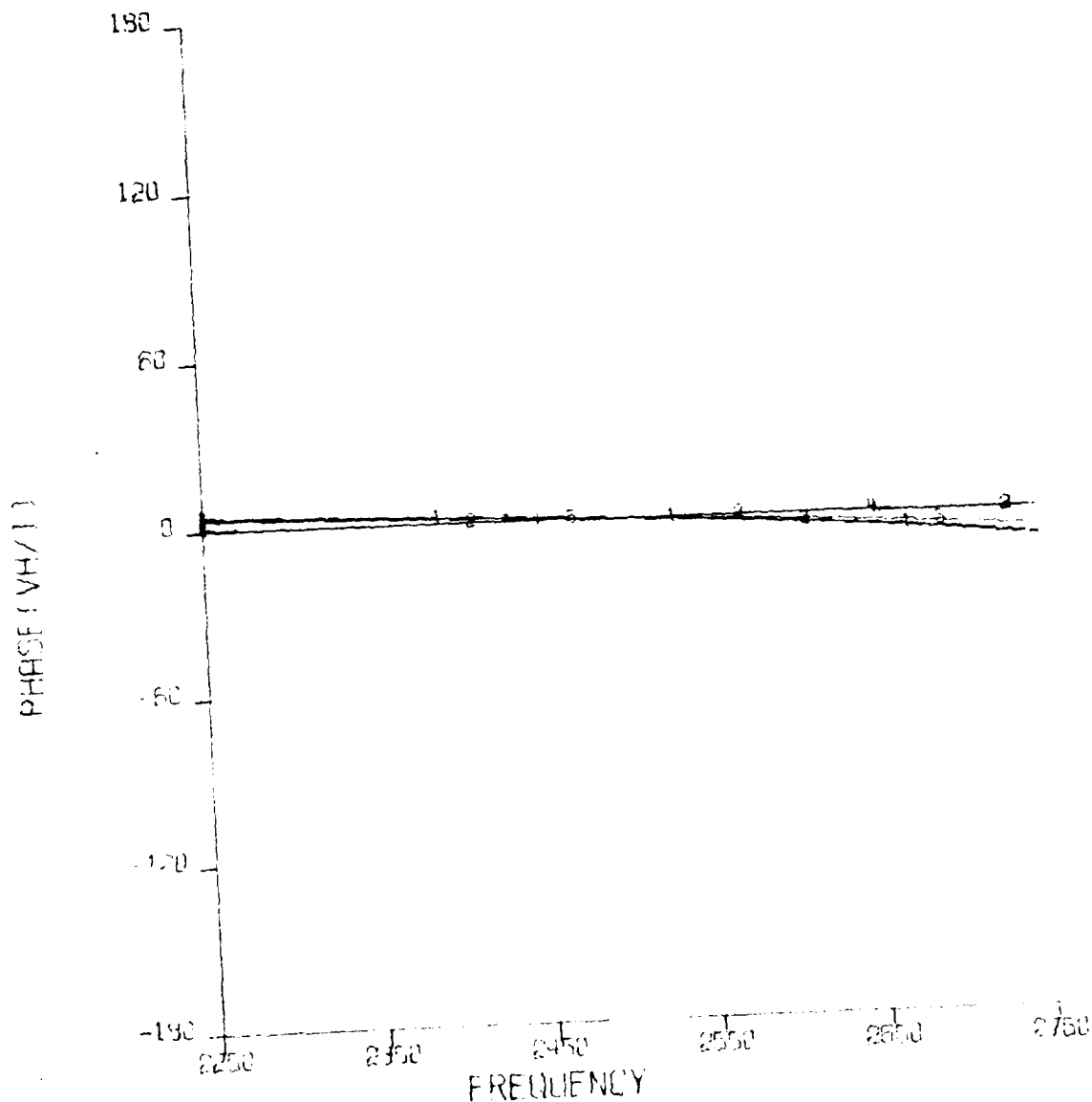
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4851 QP=E+50



MAGNITUDE VERSUS FREQUENCY

CURVE 1	MAX PRES	-50801644E03+0143403919E03
CURVE 2	MAX R	-8128015807E03+01190764474E03
CURVE 3	MIN R	-4127851865E03+0138039074E03
CURVE 4	MIN X	-5124411635E03+01180753326E03
CURVE 5	AVG	-3113528911E03+01381421445E03

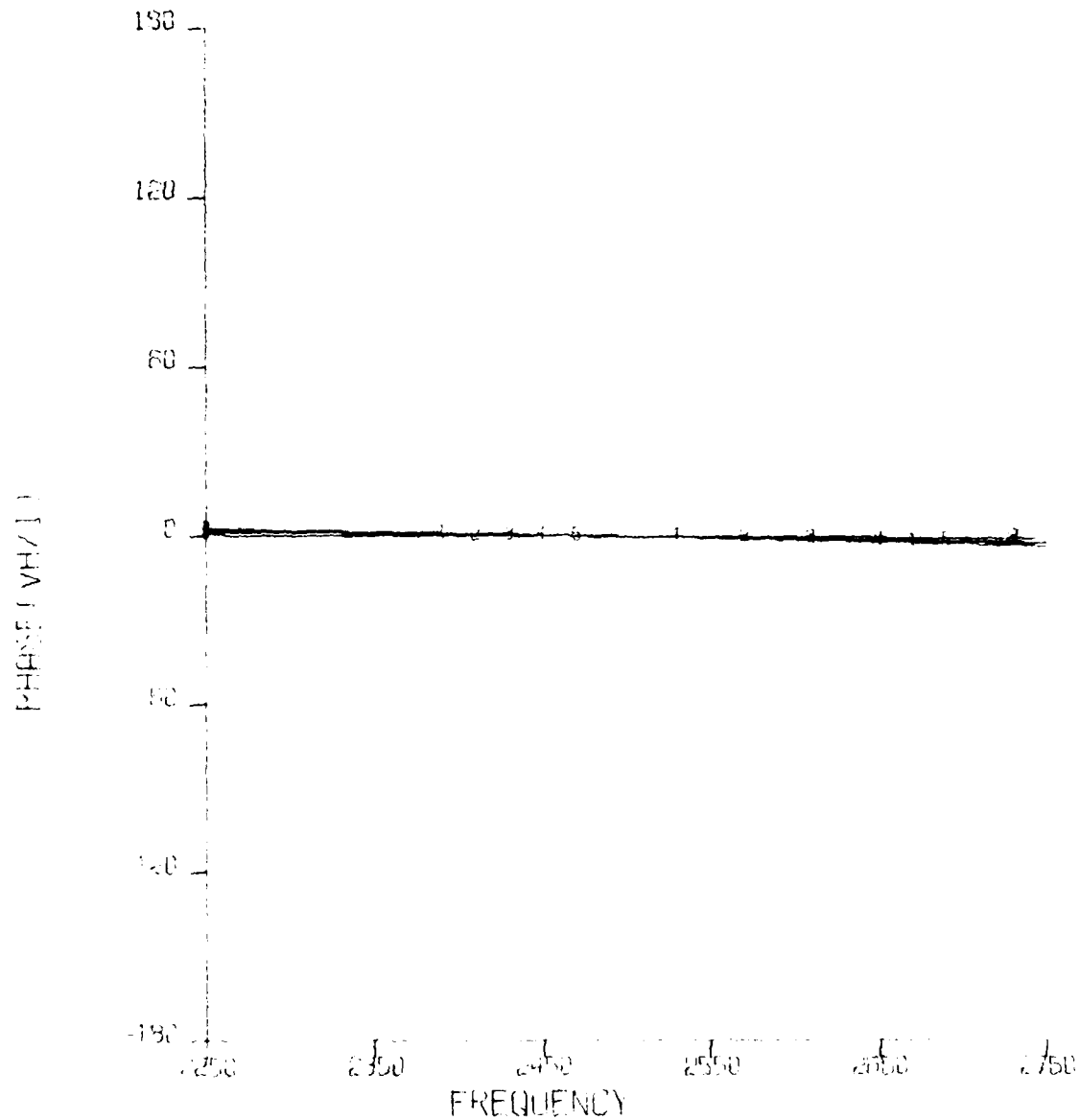
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LPE=4851 QP=E+50



PHASE (VH/1) VERSUS FREQUENCY

CURVE 1	- MAX PRES	$3.70034046E04 + j1.66823215E04$
CURVE 2	- MIN R	$3.43342781E03 + j1.81800304E03$
CURVE 3	- MAX X	$3.45145191E04 + j2.70014372E04$
CURVE 4	- MIN X	$3.80512498E03 + j6.91990765E03$
CURVE 5	- AVG	$2.81596841E04 + j4.83015054E04$

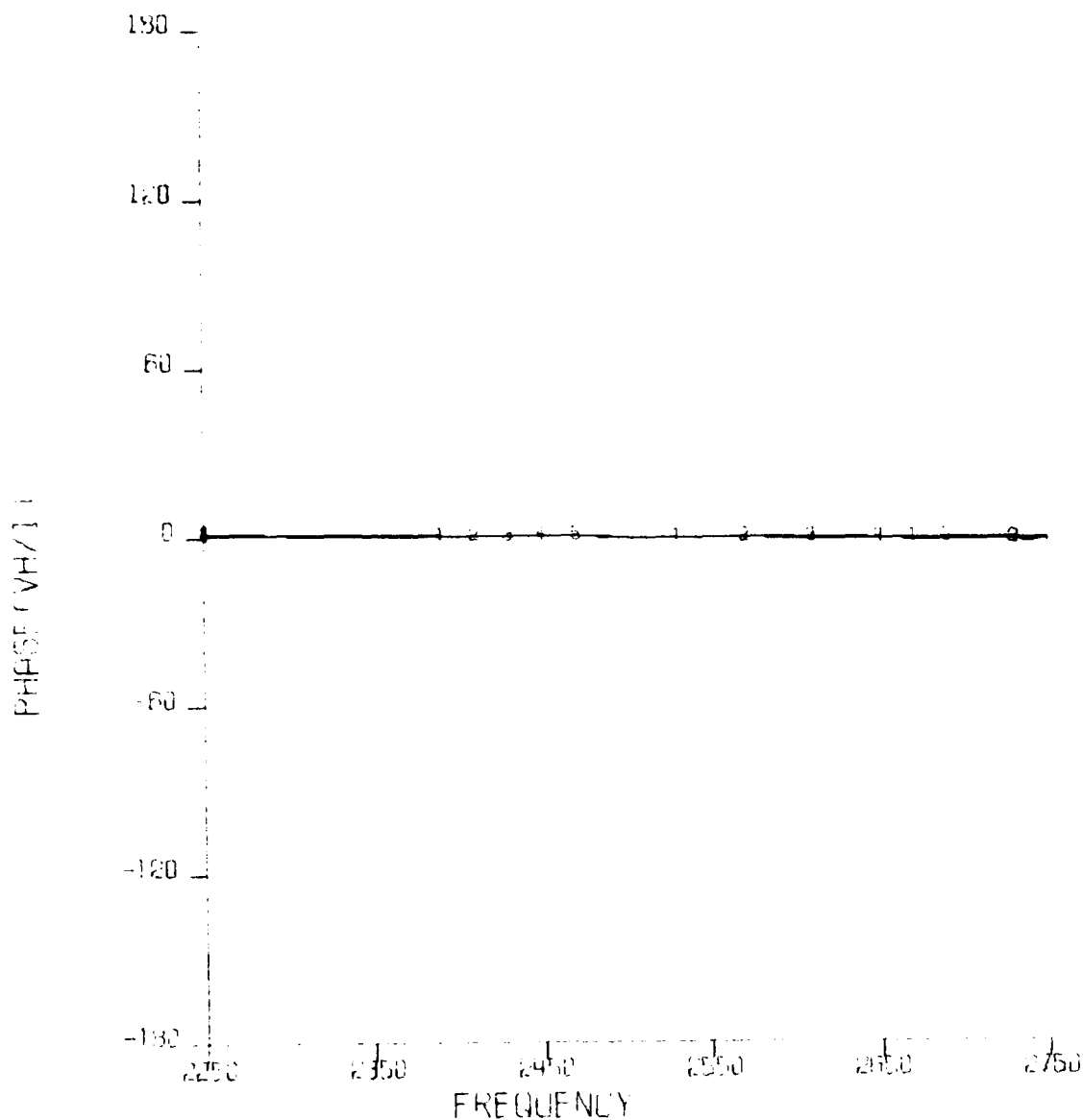
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=.4851 OP=.450



PHASE (VH/I) VERSUS FREQUENCY

CURVE 1	MAX PRES	1.01847804E04+J0.04038697E03
CURVE 2	MIN R	-3.06139341E03+J7.66241480E05
CURVE 3	MAX X	-1.07609438E04+J1.00836049E04
CURVE 4	MIN X	1.23174594E04-J9.95386351E03
CURVE 5	HVB	1.09357651E04+J4.93621119E03

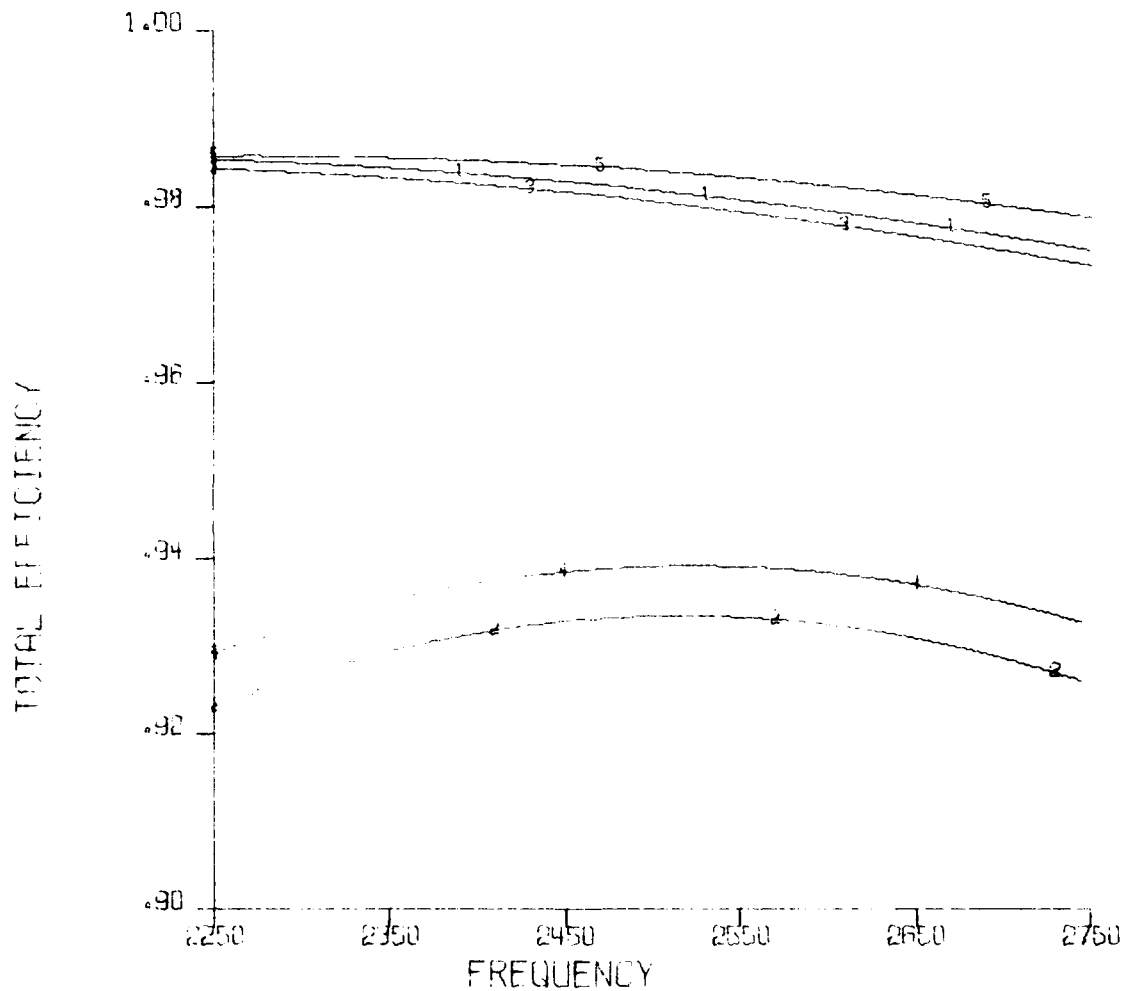
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=-4851 QP=E+50



PHASE (VH/1) VERSUS FREQUENCY

CURVE 1	MAX PRES	5.50801E44E03+07	4.3483219E03
CURVE 2	MAX R	4.180158E03+01	2.90754574E03
CURVE 3	MIN R	4.278518E03+02	3.8239074E03
CURVE 4	MIN X	5.34411E03+01	3.8275332E03
CURVE 5	RMS	1.1352091E03+03	3.8142544E03

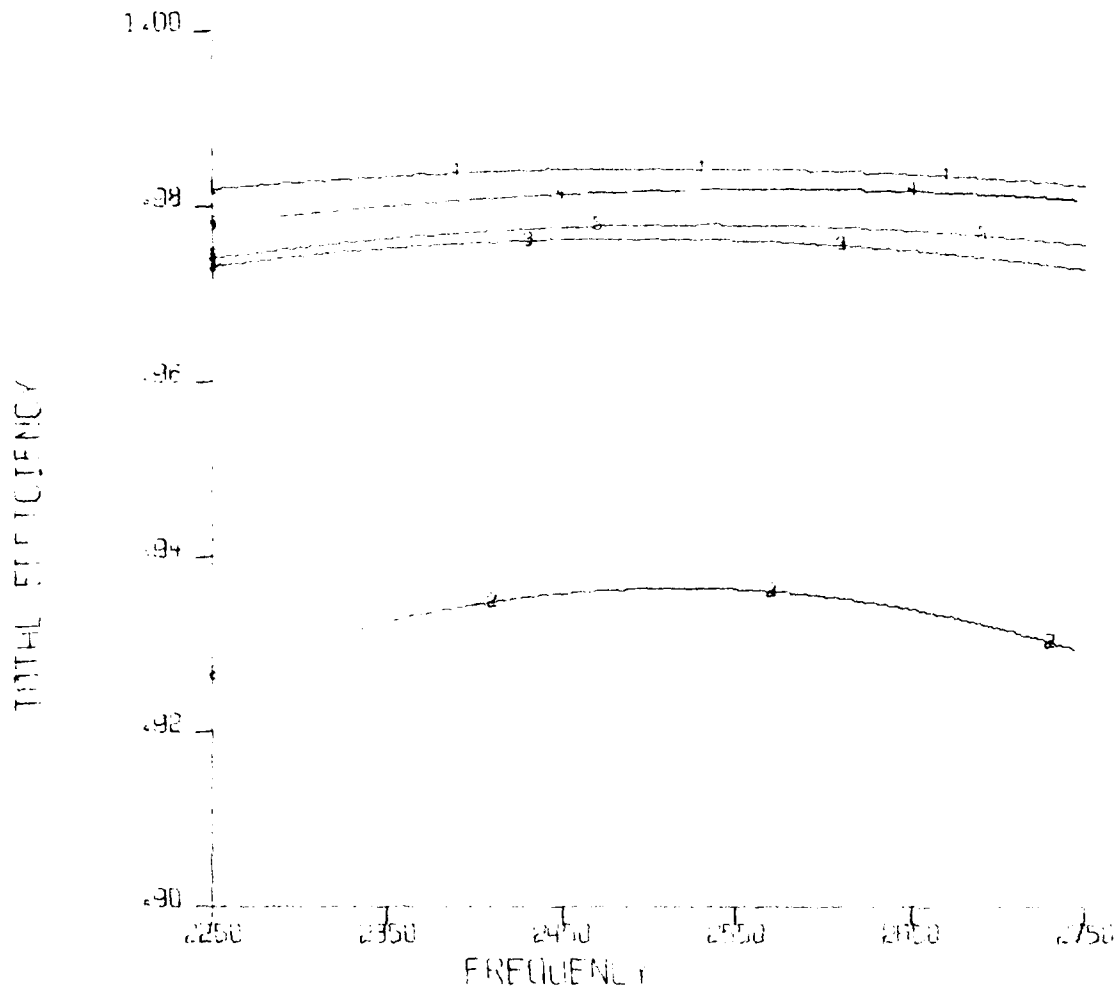
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0,0)
 LP=4851 QP=E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=3.70694046E04+J7.66828215E04
 CURVE 2 - MIN R =3.48842781E03+J7.81806304E03
 CURVE 3 - MAX X =3.43145191E04+J7.70014372E04
 CURVE 4 - MIN X =3.80512498E03+J6.31990765E03
 CURVE 5 - AVG =2.81596841E04+J4.83015054E04

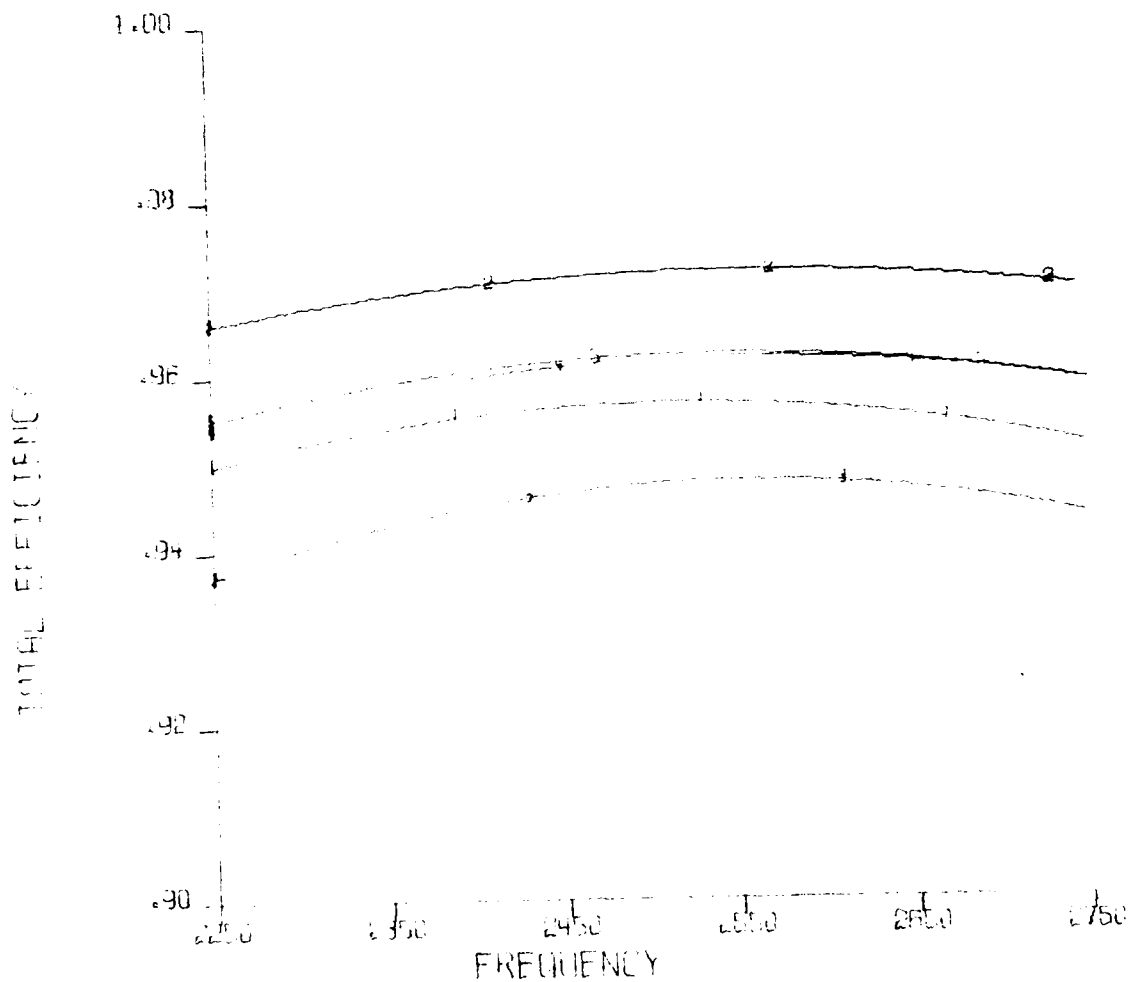
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP= 4851 QP= E+50



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRESE 1.01847804E04+06.064038097E03
 CURVE 2 - MIN R -1.285139341E05+07.065241456E05
 CURVE 3 - MAX X -1.07609438E04+01.06836049E04
 CURVE 4 - MIN X -1.28174534E04-09.95386351E02
 CURVE 5 - AVG -1.09357651E04+04.93621119E03

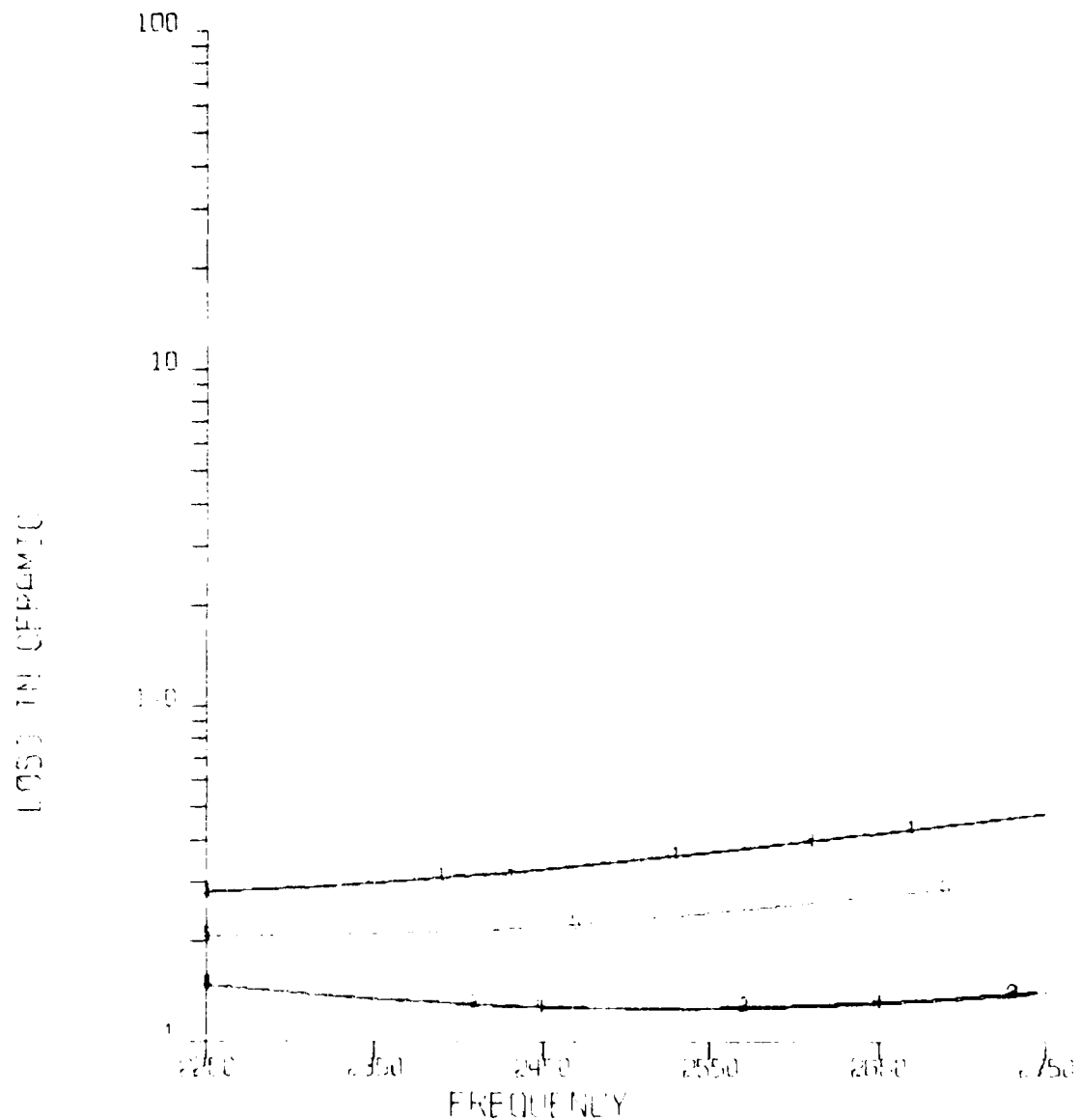
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=14851 QP=1450



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1	MAX PRES	$50801844E03 + J7.43469919E05$
CURVE 2	MAX R	$18.2380148E03 + J1.20764574E05$
CURVE 3	MIN R	$4.2735188E03 + J2.38239074E05$
CURVE 4	MIN X	$5.3441113E03 + J1.8275332E05$
CURVE 5	MIN	$1.73523317E03 + J5.8142544E05$

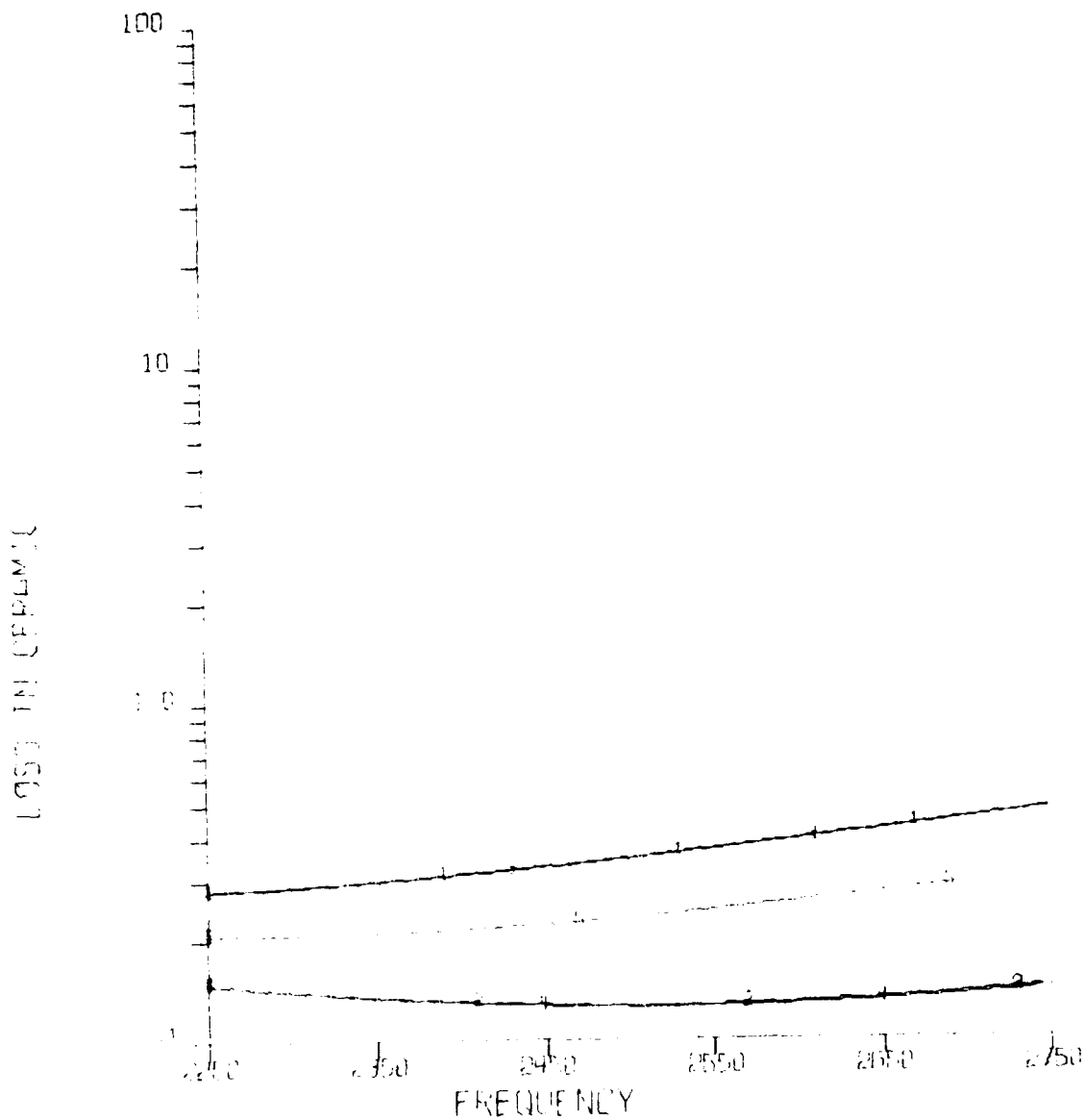
FINAL DESIGN OF ITERATION 1
 C.F. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=4851 QP=F+50



LOSS IN DBM VERSUS FREQUENCY

CURVE 1	MAX FREQ	$3.70034046E04 + 0.66823215E04$
CURVE 2	MID R	$3.455342781E03 + 0.81800304E03$
CURVE 3	MAX X	$3.455345191E04 + 0.70014572E04$
CURVE 4	MIN X	$3.80812498E03 + 0.91990765E03$
CURVE 5	RMS	$2.8159E0341E04 + 0.4783015054E04$

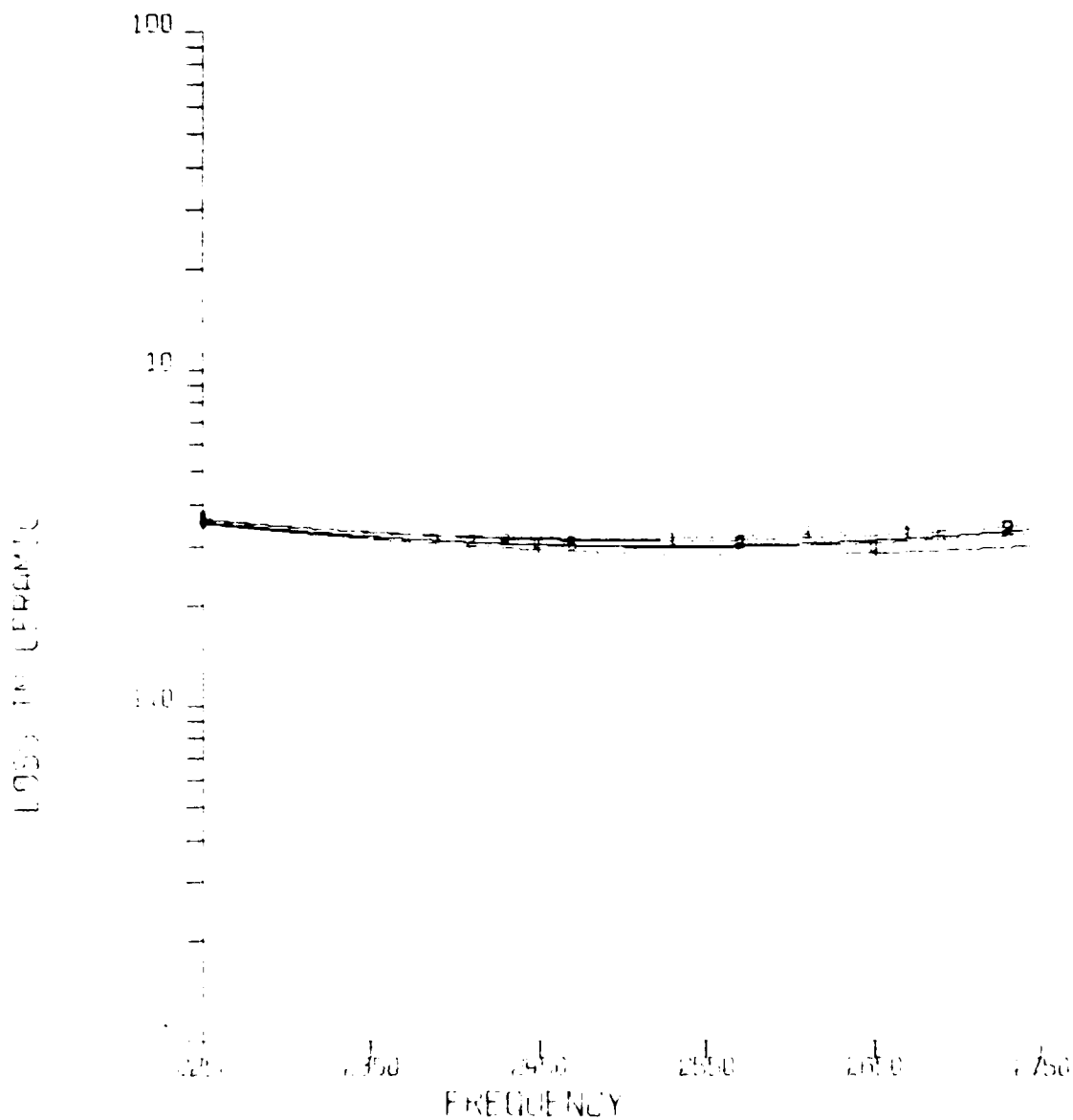
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=.4851 QP=E+50



LOSS IN DB/DIV VERSUS FREQUENCY

CURVE 1	MAX FREQ	$3.700394046E04 + j 2.66828215E04$
CURVE 2	MIN R	$3.458342781E03 + j 2.81800304E03$
CURVE 3	MAX X	$3.43145191E04 + j 2.70014372E04$
CURVE 4	MIN X	$3.309512498E03 + j 2.91990765E03$
CURVE 5	AVG	$2.81598341E04 + j 4.83015054E04$

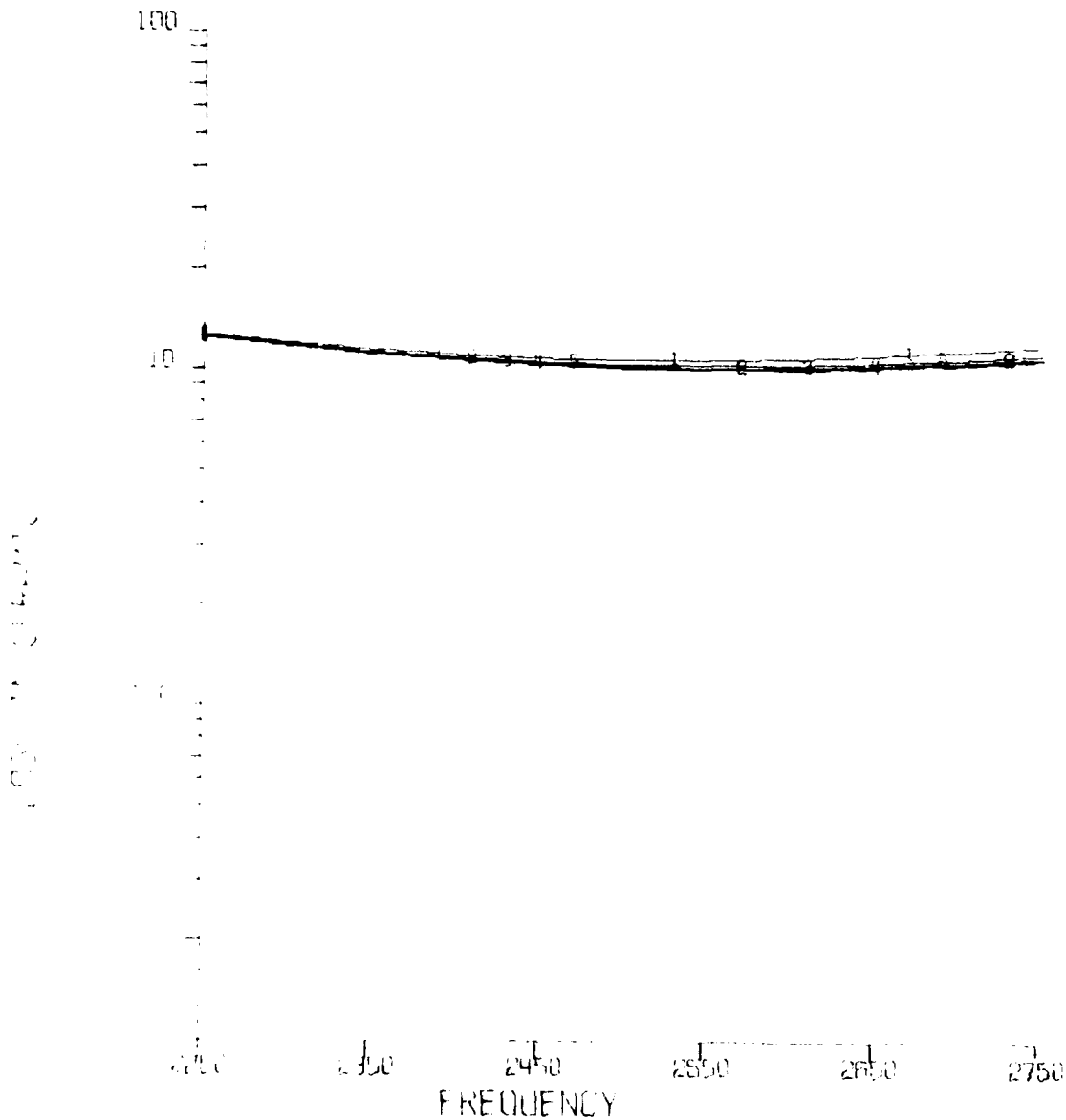
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP = 4851 OP = E + 50



LOSS IN DBM VERSUS FREQUENCY

CURVE 1	MAX LOSS	1.01342804E 04 + 1.014038097E 03
CURVE 2	MIN LOSS	3.683139341E 03 + 1.016624148E 03
CURVE 3	MAX LOSS	1.078009438E 04 + 1.01836042E 04
CURVE 4	MIN LOSS	1.28174594E 04 + 9.953803E 02
CURVE 5	Avg	1.09357891E 04 + 1.93621139E 03

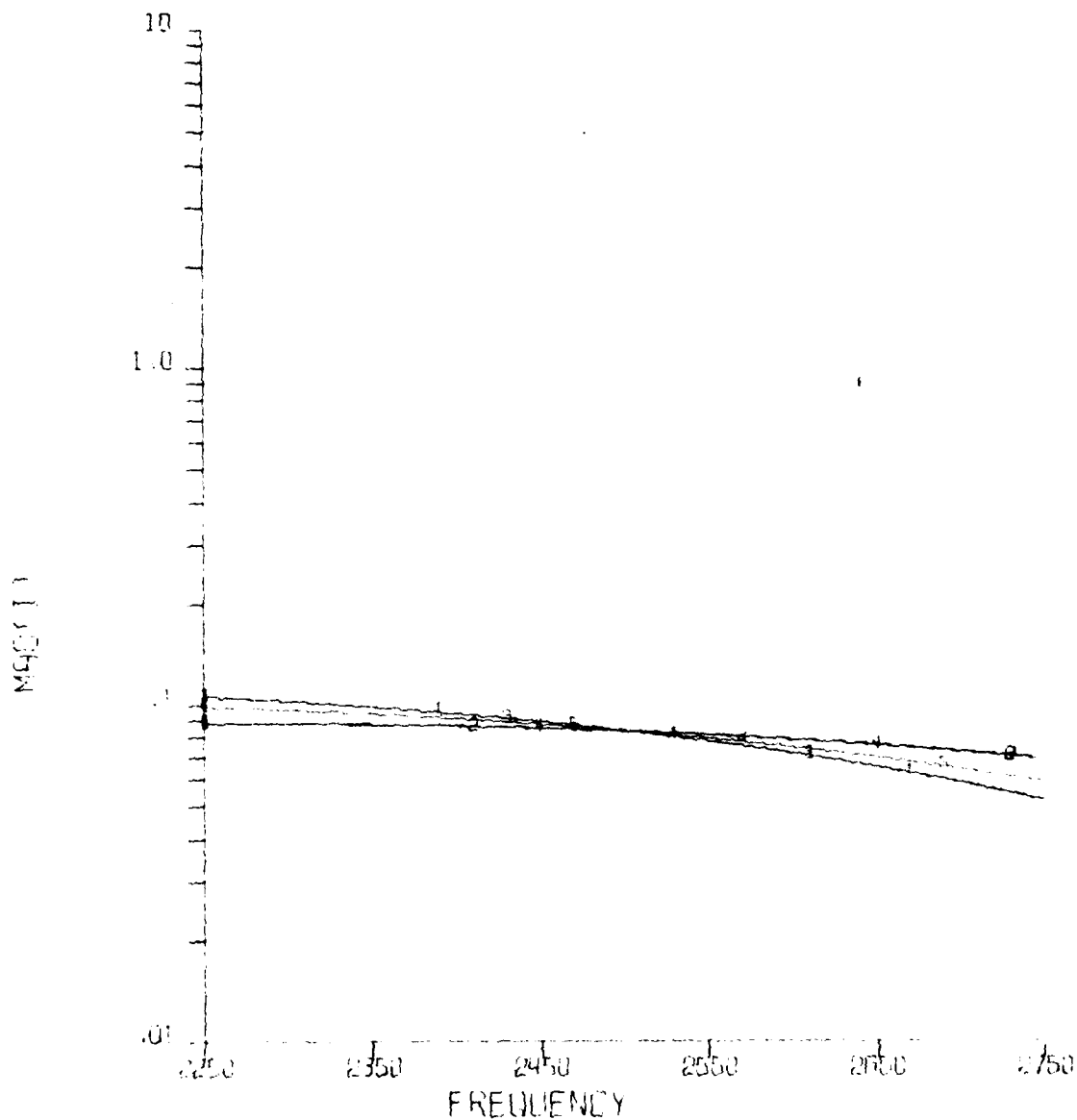
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4851 OP=E+50



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1	MAX PRES	5.50801644E03+01	4.3463912E03
CURVE 2	MAX K	3.13015367E03+01	2.20754474E03
CURVE 3	MIN K	4.12785186E03+02	3.8239074E03
CURVE 4	MIN X	5.94411225E03+01	7.82753326E03
CURVE 5	AVG	6.13520911E03+03	8.1425444E03

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=-4851 QP=E+50



MAG(1) VERSUS FREQUENCY

CURVE 1	MAX PRES	$3.70694046E04 + 0.66823215E04$
CURVE 2	MIN R	$3.48842781E03 + 0.81300304E03$
CURVE 3	MAX X	$3.43145191E04 + 0.70014372E04$
CURVE 4	MIN X	$3.80512498E03 + 0.31990765E03$
CURVE 5	AVG	$2.81595841E04 + 0.83015004E04$

FINAL DESIGN OF ITERATION 1

C.F. 1.1 5 INCH CIRCULAR HEAD

MID BAND 30 DEGREE (0.30)

LP=-.4851 QP={ +50)



MULTI-VERSION REFERENCE

Curve 1: Max PRES = 0.01341804E 04 + 0.096586E 17E 05

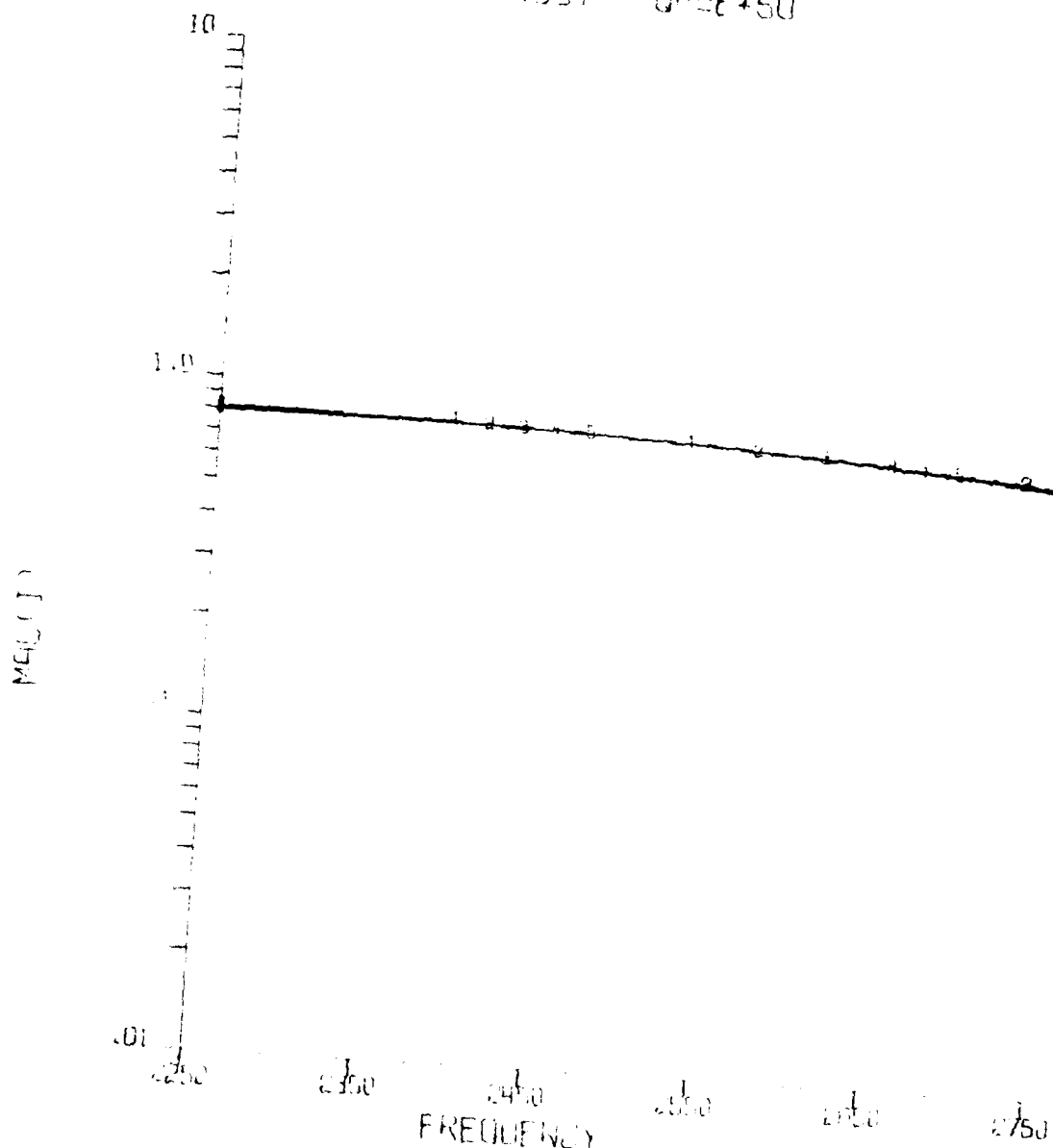
DATE: 11/11/2014 TIME: 10:24:50

CURVE 3 MRA A 1.01760034 38E 04+ 1.0183 38E 04+ 9E 04

CURVE 4 477.4 14.331 24' 14.114 13 25.381 24.110.

Curve = MV1 - 0.047876 + 0.049434 * 936221.9405

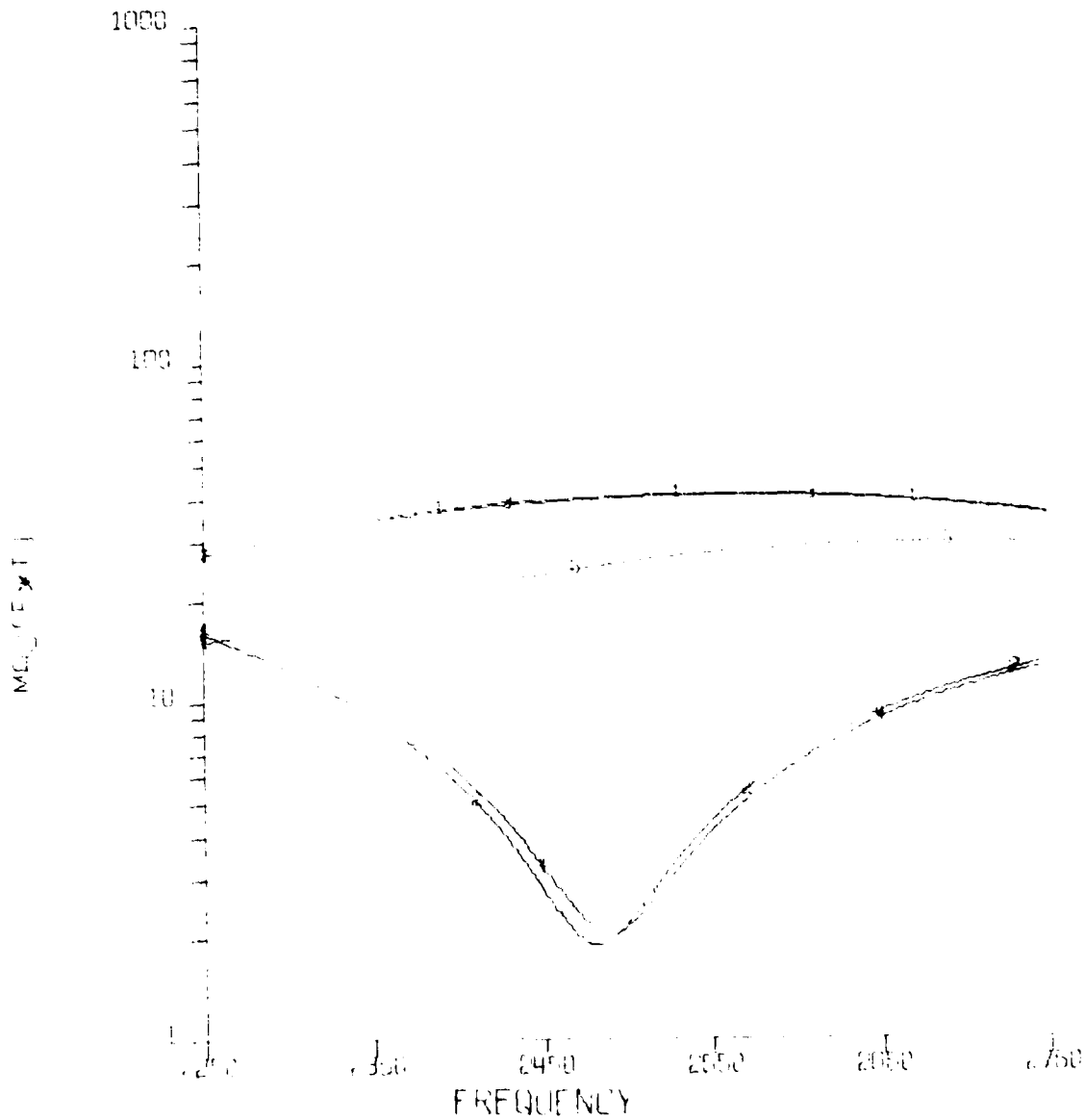
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LF=4851 QP=1+50



MAG (Y) VERSUS FREQUENCY

CURVE 1	MAX PRES	5.50801E+03	+07.43410919E03
CURVE 2	MAX R	-8.18015867E03	+01.20754674E03
CURVE 3	MIN R	-4.27851865E03	+02.38239074E03
CURVE 4	MIN A	-8.94411E03	+01.78275332E03
CURVE 5	AVG	0.13520211E03	+05.81629471E03

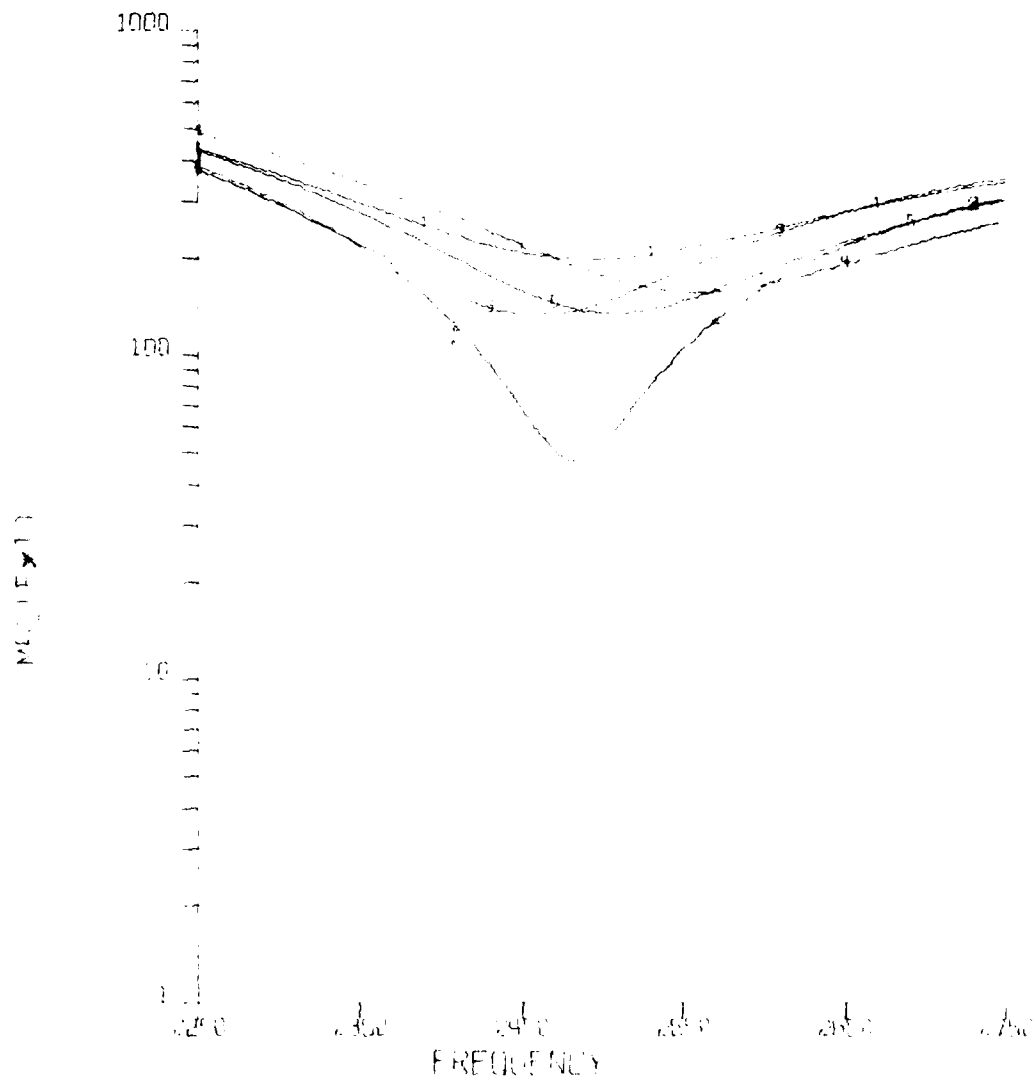
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP=4851 QP=E+50



MAGNITUDE VERSUS FREQUENCY

CURVE 1	MAX PRES	3.70094046E 04+01.60828015E 04
CURVE 2	MIN R	3.43942781E 03+01.81800304E 03
CURVE 3	MAX X	3.43145191E 04+01.70014372E 04
CURVE 4	MIN X	3.30912498E 03+00.91990765E 03
CURVE 5	AVG	2.81598341E 04+01.83015054E 04

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0.30)
 LP=14851 QP=E+50



MAGNITUDE VERSUS FREQUENCY

CURVE 1	MAX	1.021347804E 04 + 0.04038827E 03
CURVE 2	MIN	3.00139341E 03 + 0.00241950E 03
CURVE 3	MAX	1.017809438E 04 + 0.00836049E 04
CURVE 4	MIN	1.023174484E 04 + 0.00538635E 03
CURVE 5	MIN	1.04357651E 04 + 0.00362119E 03

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=.4851 OP=E+50

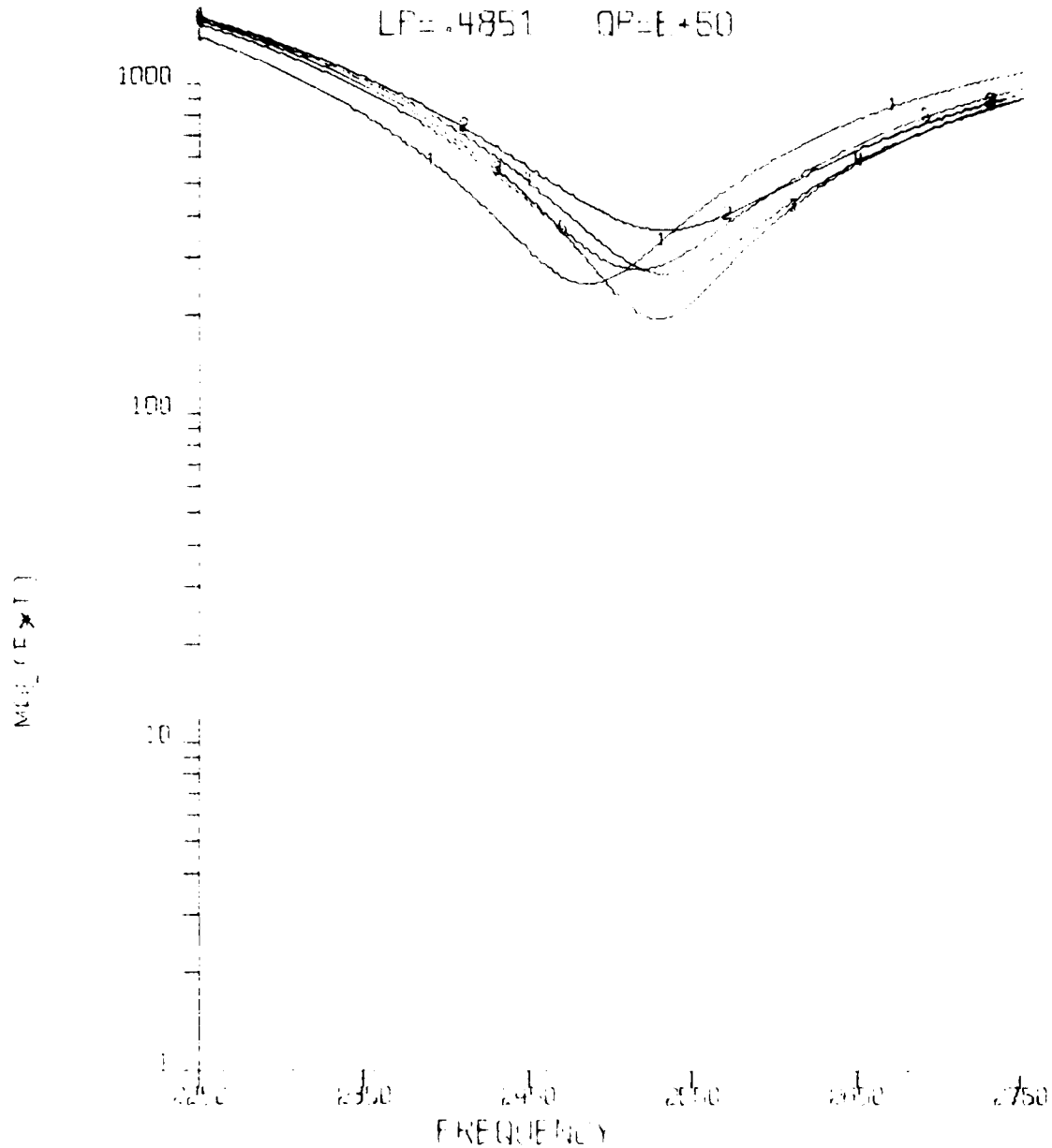
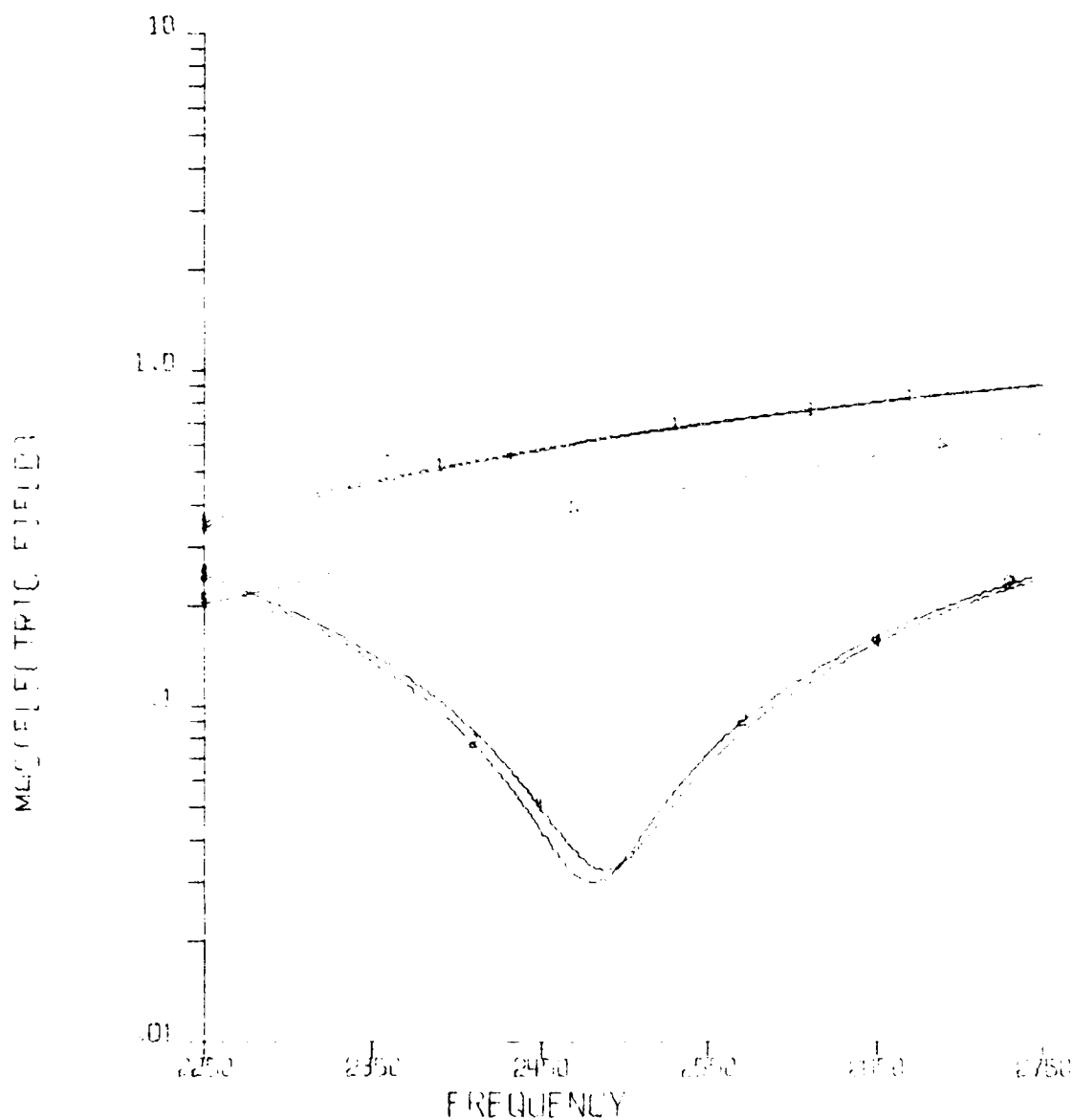


TABLE X-1 VERSUS FREQUENCY

CURVE 1	MAX PRES	$5.01601044E03 + 0.043409919E03$
CURVE 2	MAX R	$3.208015307E03 + 0.020754474E03$
CURVE 3	MIN R	$-4.627891901E03 + 0.038239074E03$
CURVE 4	MIN X	$1.034411090E03 + 0.01382753326E03$
CURVE 5	RVD	$0.13520311E03 + 0.0081420405E03$

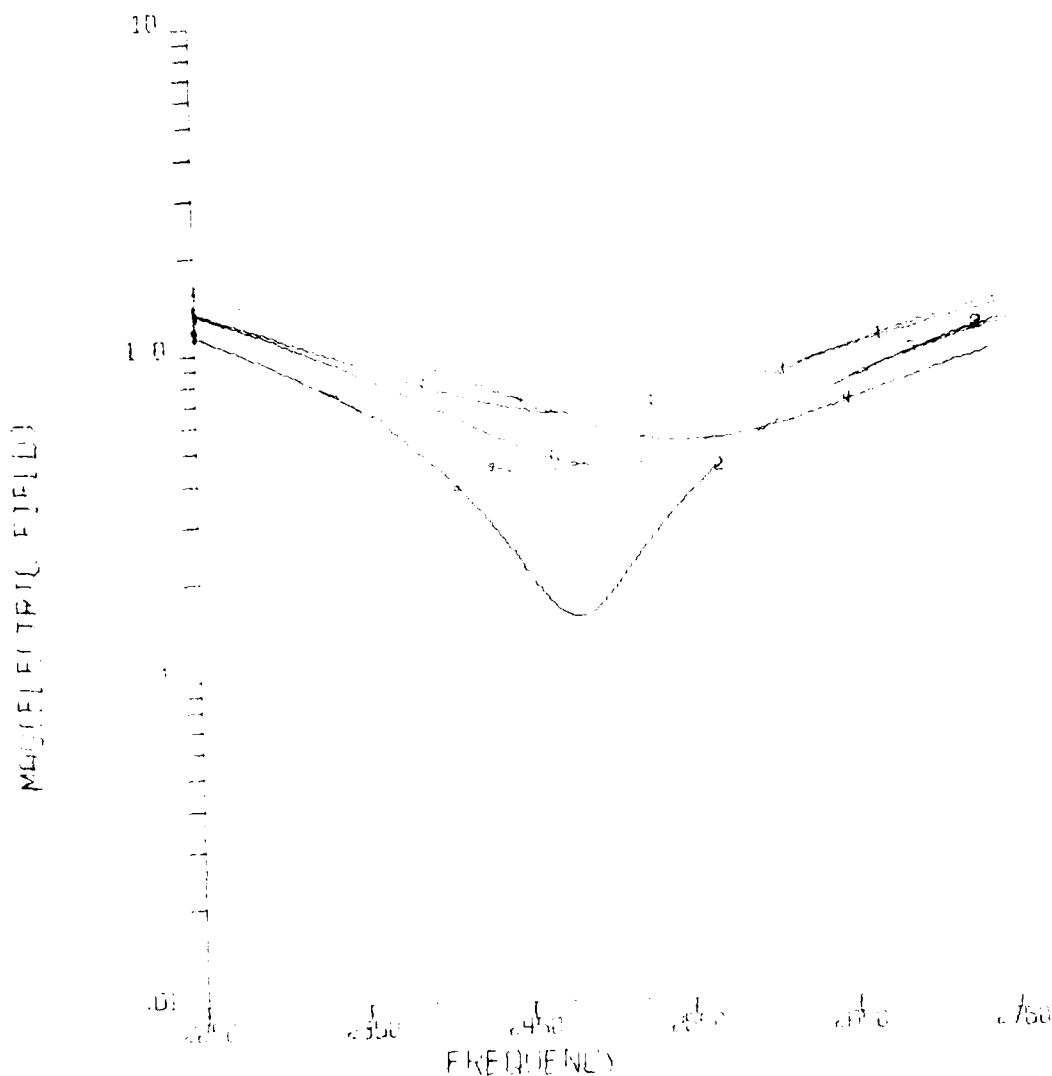
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND ENDFIRE (0.0)
 LP= 4851 SP E+50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1	MAX FRES	3.7009404E 04	3.74863E 03
CURVE 2	MIN R	3.4884E 03	3.8180E 03
CURVE 3	MAX X	3.4314519E 04	3.70019E 03
CURVE 4	MIN X	3.8051249E 03	3.19907E 03
CURVE 5	AVG	3.8154834E 04	3.26301E 03

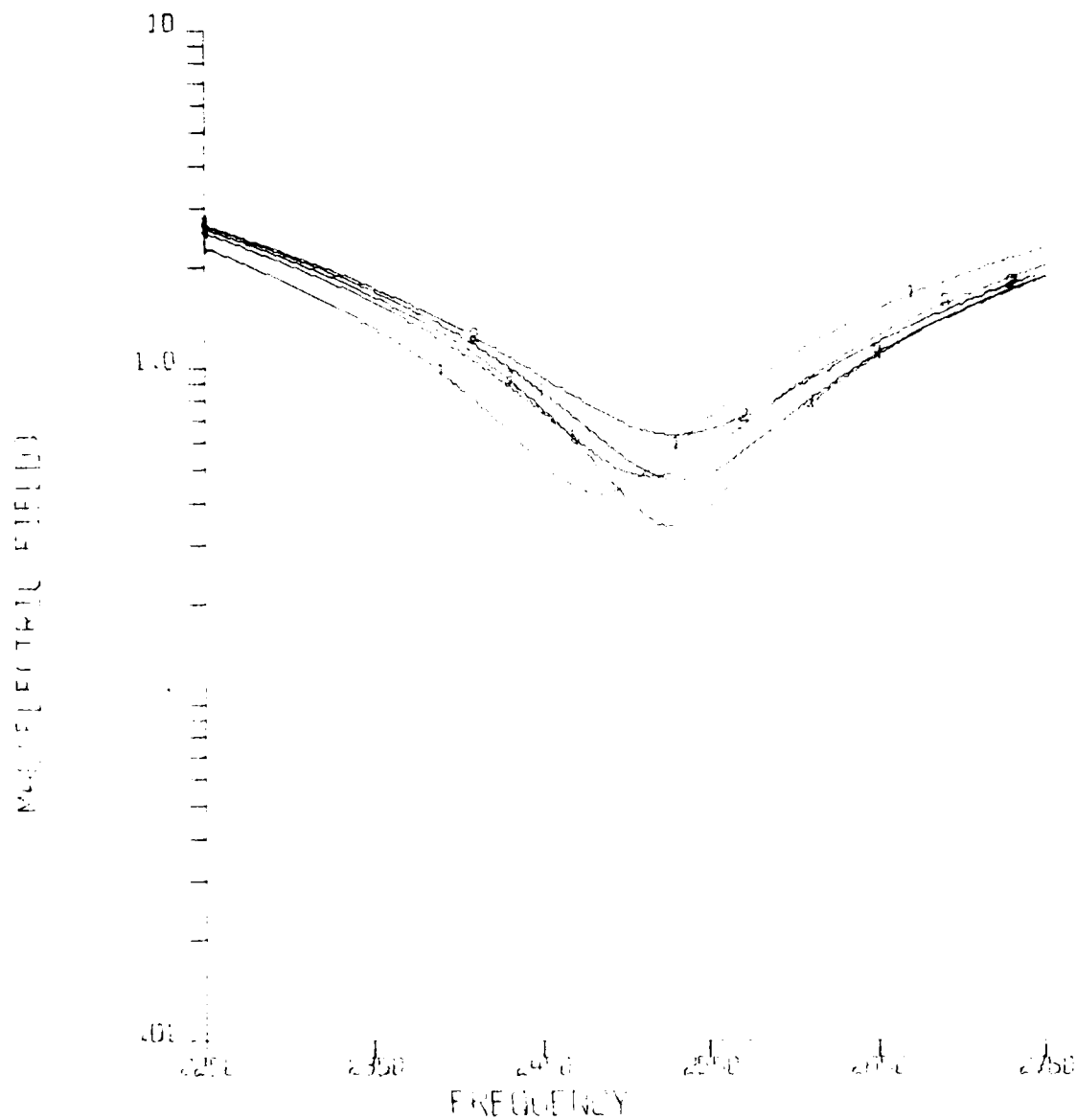
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND 30 DEGREE (0,30)
 LFE-4851 QP-E-50



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1	MAX	1.1154780E-04	1.154058097E-03
CURVE 2	MIN	3.450139341E-05	1.600241456E-03
CURVE 3	MAX	1.05809438E-04	1.000838049E-04
CURVE 4	MIN	1.03174504E-05	9.05380351E-05
CURVE 5	MAX	8.9357E-06	6.293027119E-05

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 MID BAND BROADSIDE (0.90)
 LP=4851 OP=E+50



MAGNETIC FIELD VERSUS FREQUENCY

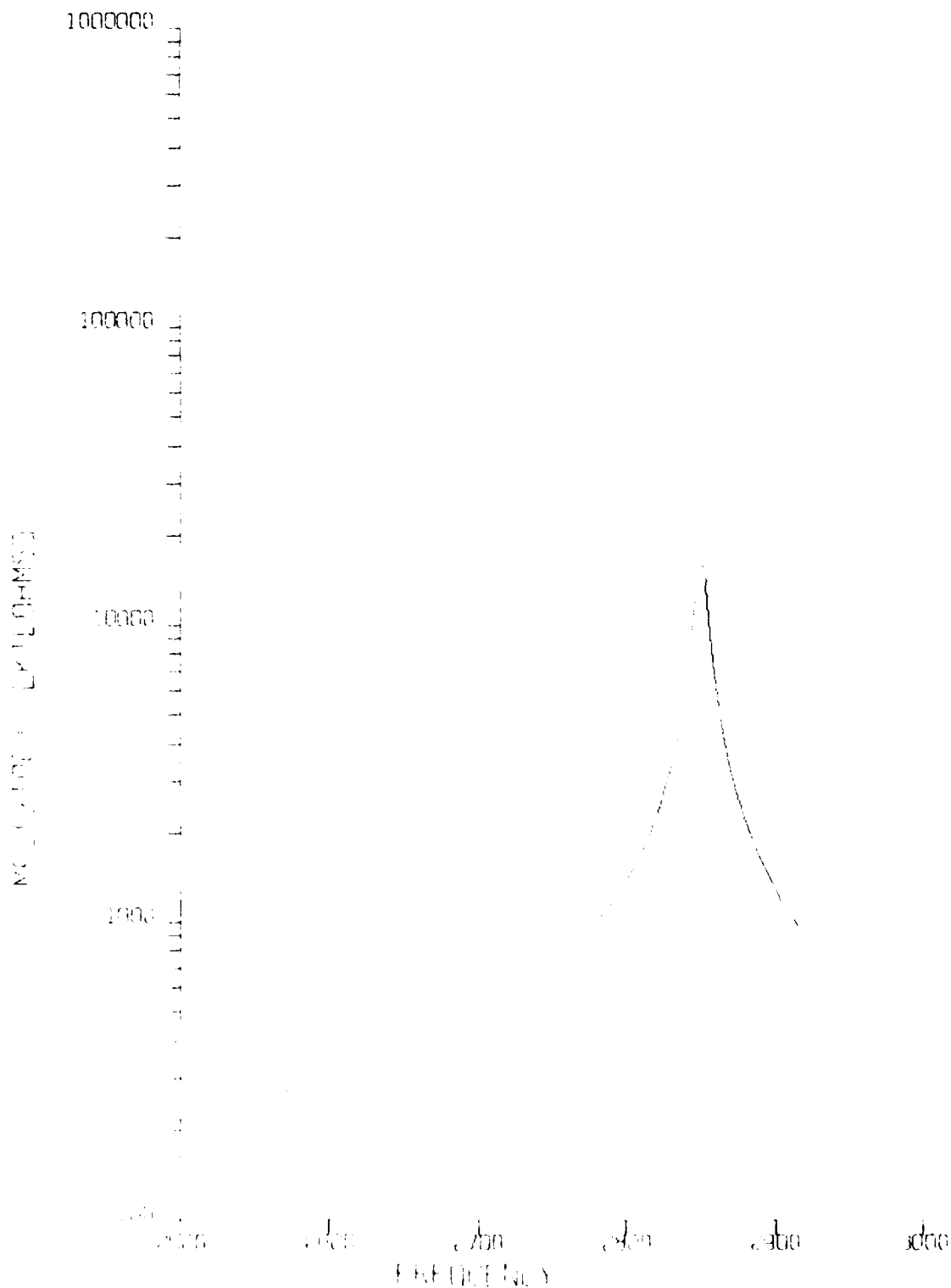
CURVE 1	MAX PRES	5.50801644E03+J2.43400912E03
CURVE 2	MAX K	3.33801530E03+J1.90754741E03
CURVE 3	MIN K	4.27851305E03+J2.38239074E03
CURVE 4	MIN K	5.34411125E03+J3.81753321E03
CURVE 5	MIN	6.43520911E03+J5.81925445E03

TRACOR, INC.

HIGH BAND

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND

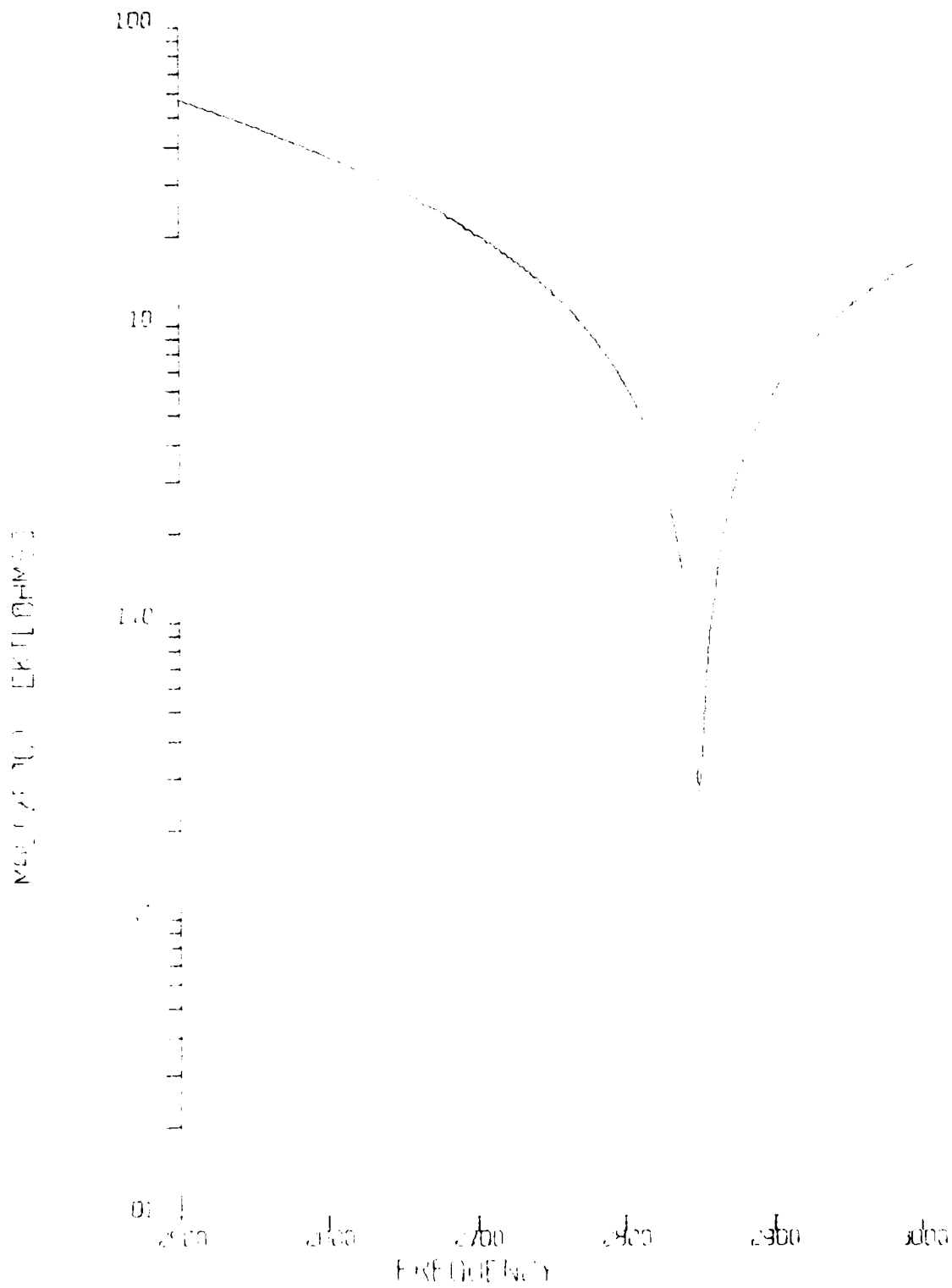
LP=43295 OP=E+50 CS=12094E 7 DS=0



SCALE 2.75E+05 FREQUENCY

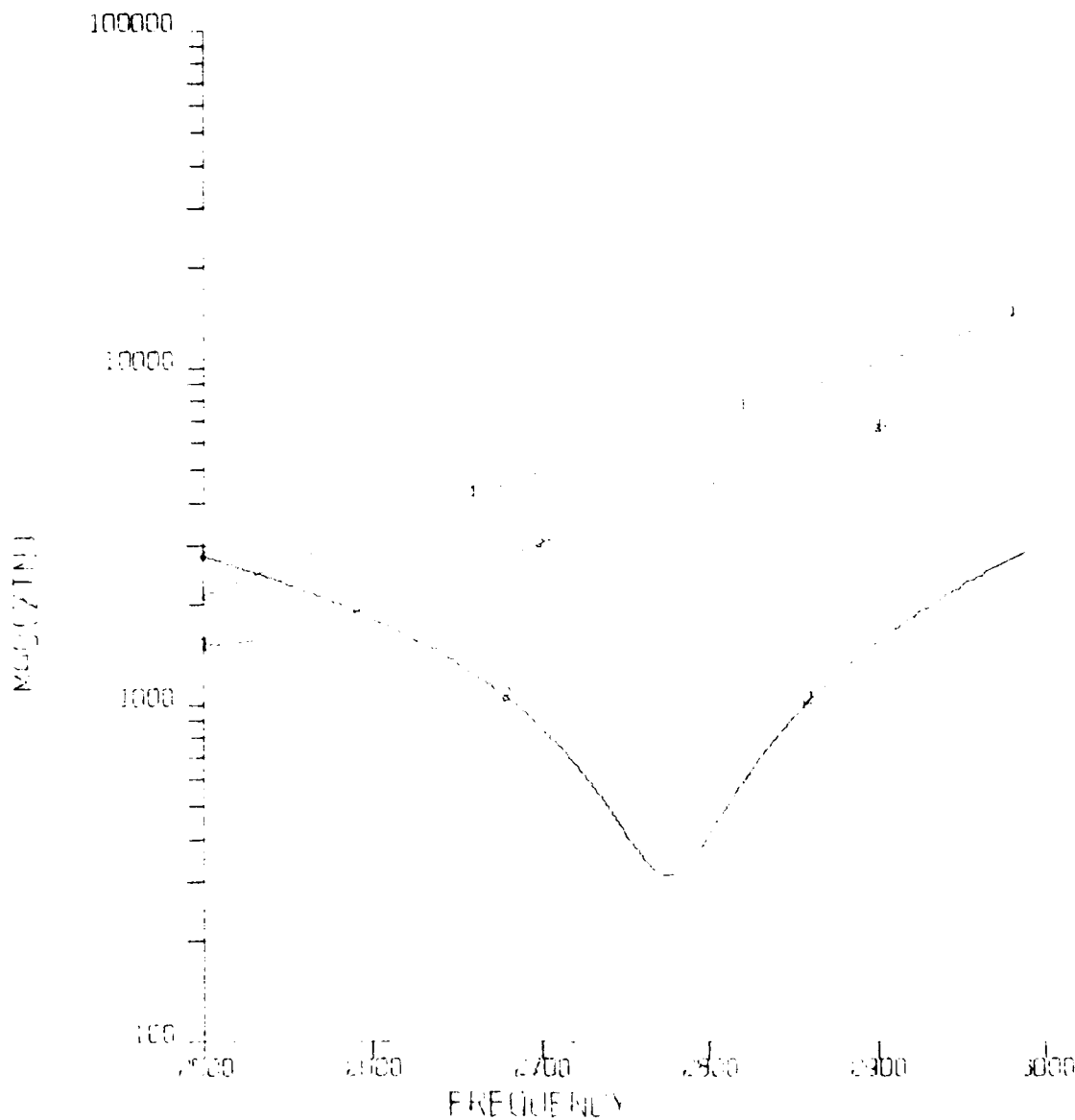
FINAL DESIGN OF ITERATION 1
C.P. 1.1 5 INCH CIRCULAR HEAD
HIGH BAND

LP=.3295 OP=E+50 CS=.2094E-7 DS=0



PHASE (DEG) VERSUS FREQUENCY

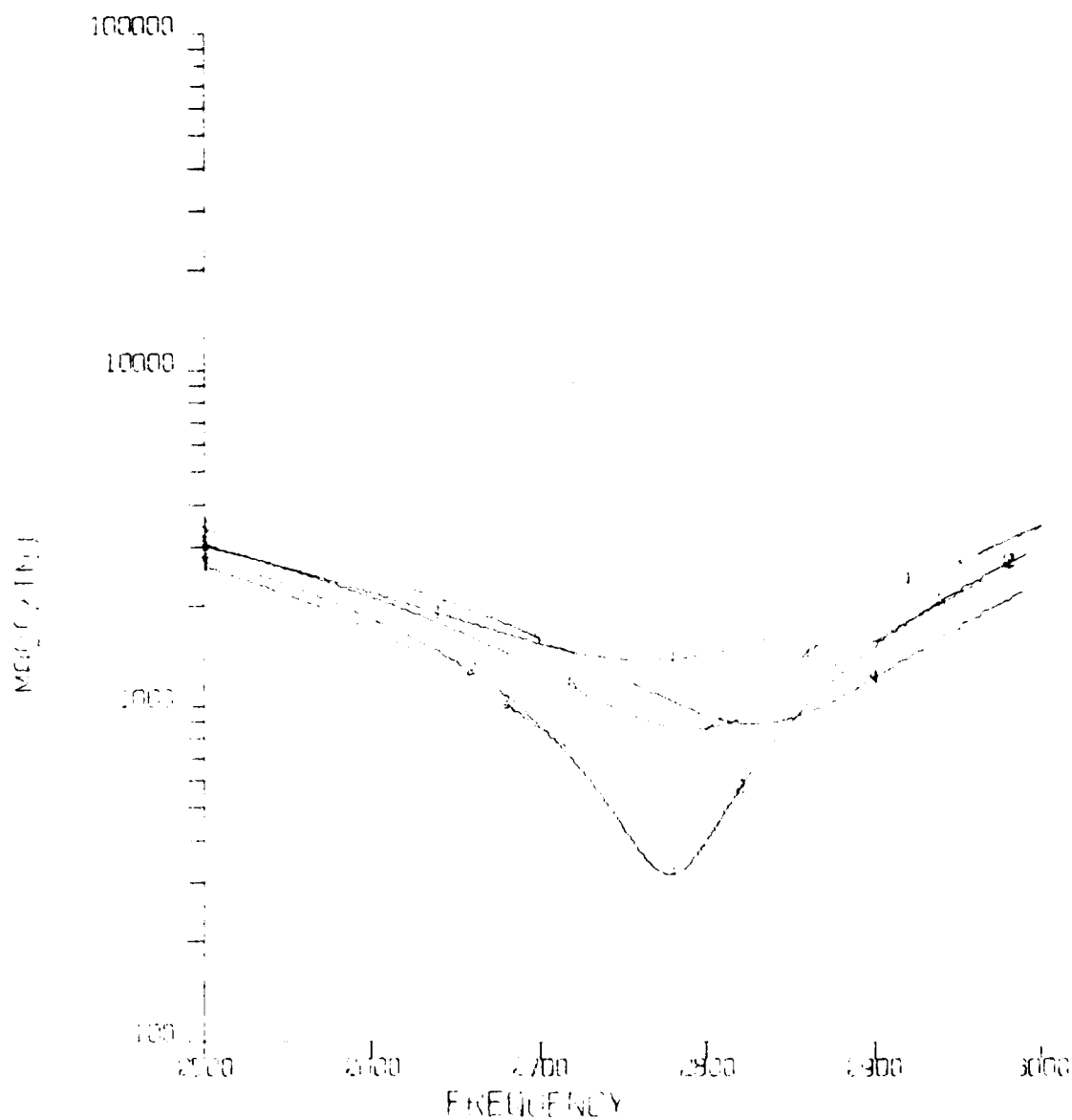
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LPA-3295 OF-E-50 CS-2094E-7 DS-0



MAG (DB) VERSUS FREQUENCY

CURVE 1 MAX FREQS 4.05970761E-04+05.43305975E-04
 CURVE 2 MIN FREQS 3.40113917E-04+05.28735148E-04
 CURVE 3 FREQS 3.40113917E-04+05.28735148E-04

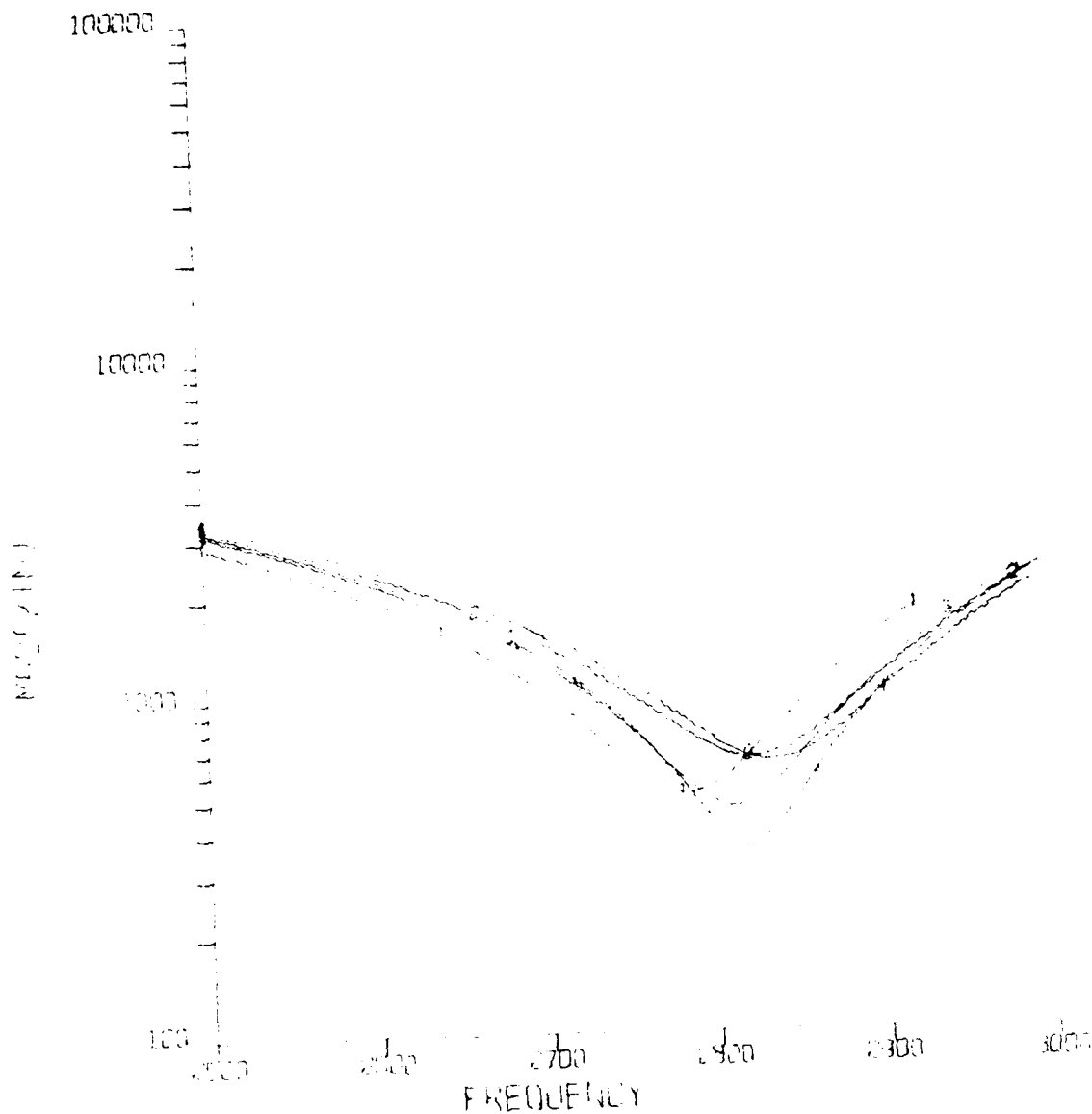
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=3295 OP=+50 CS=-2094E-7 DS=0



MAGNITUDE VERSUS FREQUENCY

CURVE 1	MAX FREQ	3.02281E+04+1.5+1.0068045E+05
CURVE 2	MIN F	3.23324330E+03+1.9+0.1238199E+05
CURVE 3	MAX X	3.344170071E+03+0.1+2.0617600E+04
CURVE 4	MIN X	3.173344096E+03+0.1+2.307533E+03
CURVE 5	AVG	2.8554447E+03+0.1+3.9805126E+03

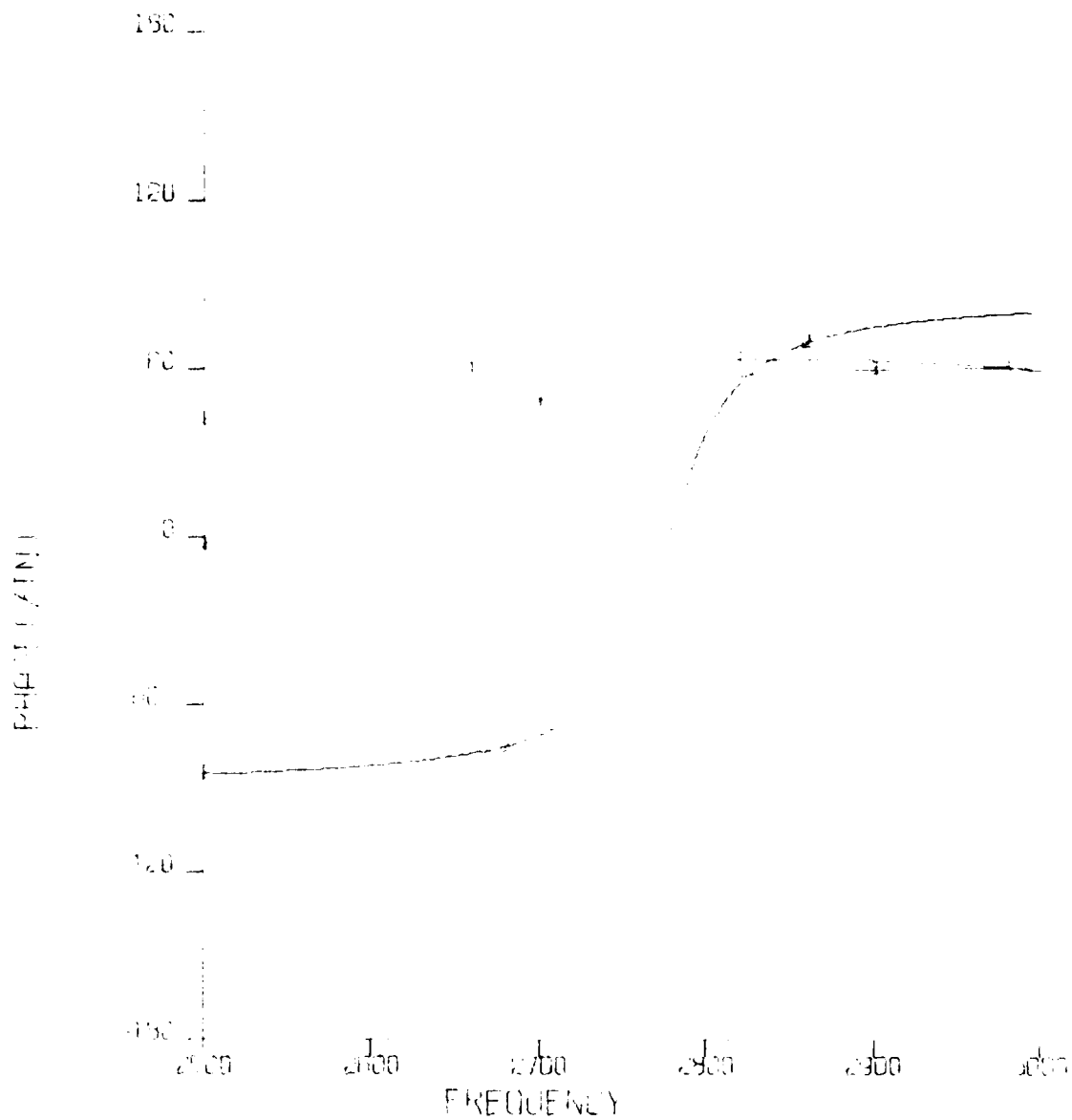
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3295 OP=E+50 CS=.2094E-7 DS=0



MAG/DBM VERSUS FREQUENCY

CURVE 1	MAX	REF	= 3.3226E+05	3.3019E+05
CURVE 2	MAX	REF	= 1.0460E+05	7.938E+04
CURVE 3	MAX	REF	= 3.7803E+04	3.44E+04
CURVE 4	MAX	REF	= 8.7763E+03	1.4105E+04
CURVE 5	MAX	REF	= 1.078E+03	4.739E+02

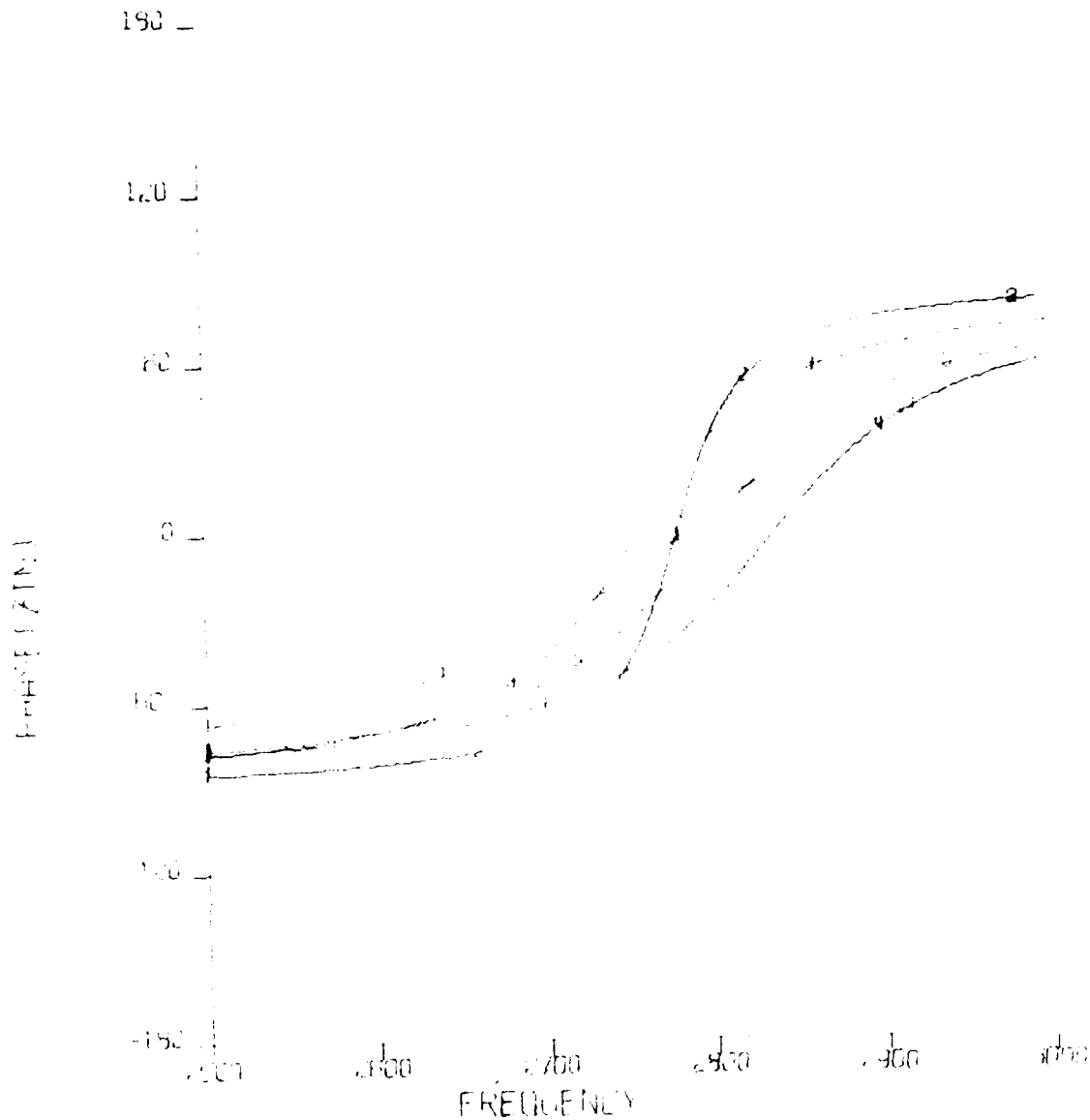
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=13295 OP=1450 CS=12094E-7 DS=0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1 MAX PRES 4.033707011E+04 15.45305975E+04
 CURVE 2 MIN PRES 3.501189175E+04 14.28135198E+04
 CURVE 3 AVG 3.705005332E+04 14.86781111E+04

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=3295 OF E+50 CS=2094E-7 BS=0



PHASE (ZIN) VERSUS FREQUENCY

CURVE 1	MAX PRES	1.00E+00	3.02281E+04	1.5E+00	1.00E+00
CURVE 2	MAX X	3.5E+00	3.4885E+03	1.00E+00	3.5E+00
CURVE 3	MAX X	3.5E+00	7.00E+03	1.00E+00	3.5E+00
CURVE 4	MAX X	2.738E+00	1.96E+03	1.00E+00	3.075E+00
CURVE 5	MAX	2.03E+00	3.44E+03	1.00E+00	2.34E+00

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0,90)
 LP=43295 OP=1E+50 CS=42094E-7 DS=0

190 —

120 —

60 —

0 —

0 —

0 —

10000

2000

3000

4000

5000

6000

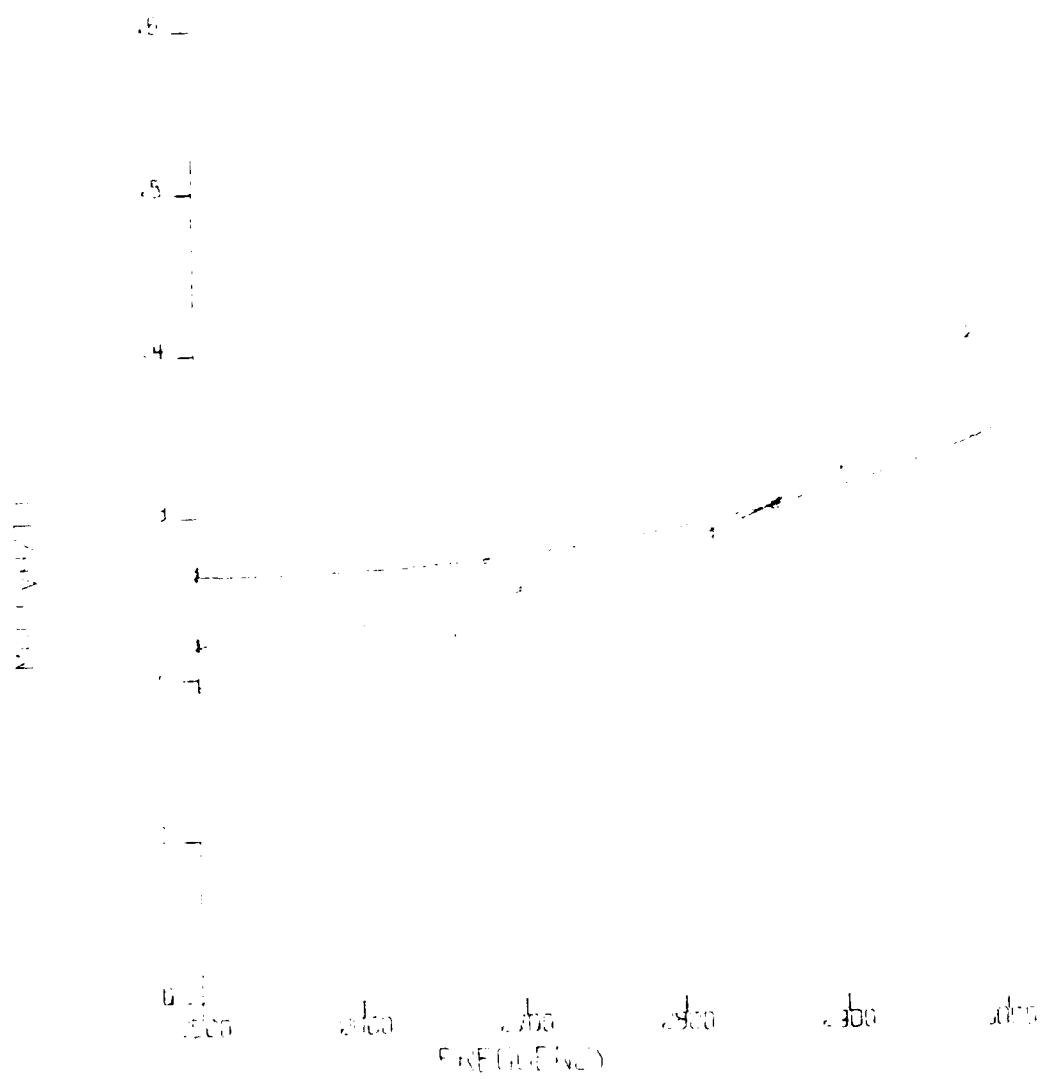
FREQUENCY

TIME IN SECONDS VERSUS FREQUENCY

CURVE 1	MAX FREQ	43295.00E+03+CS=42094E-07
CURVE 2	MAX FREQ	74000.00E+03+CS=79989.79E+03
CURVE 3	MAX FREQ	37800.00E+03+CS=49420.49E+03
CURVE 4	MAX FREQ	21780.00E+03+CS=110105.30E+03
CURVE 5	MAX FREQ	11000.00E+03+CS=49789.78E+03

SCALED TO K-L BORN

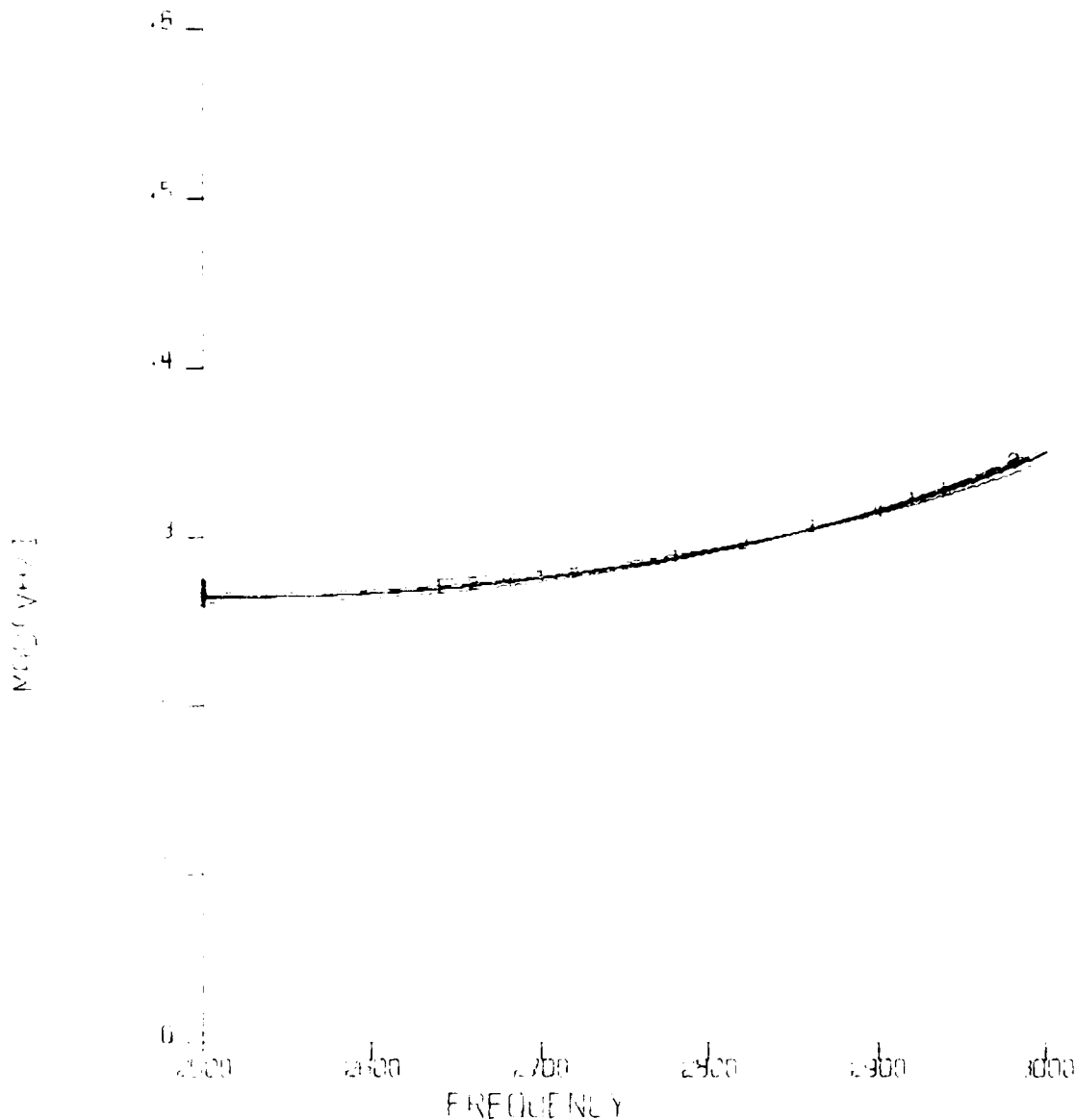
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=3295 OP=450 CS 2094E 7 DS=0



WAVELENGTH INFLUENCE

CURVE 1	MAX. LOSS	4.0 5870.7811 044.15 9530.5375 105
CURVE 2	MIN. LOSS	3.5 6138.81 7810.3 9428.135 98105
CURVE 3	AVG. LOSS	3.0 6015.3321 064.15 9578.135 105

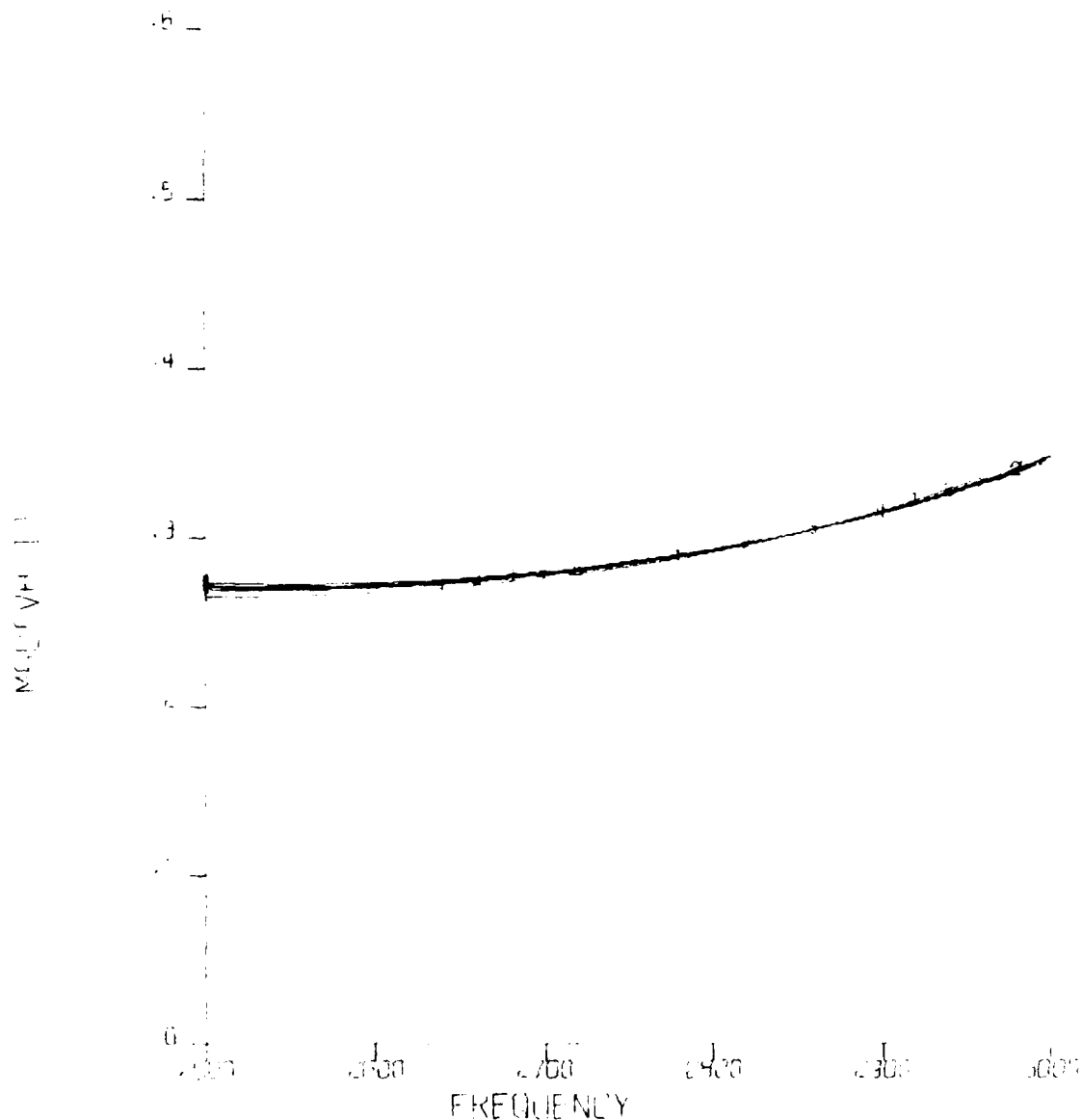
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LPE=.3295 OPEE+.50 CS= 2094E-7 DS=0



MAG. VOLT. VERSUS FREQUENCY

CURVE 1	MAX. FREQ.	3022.81E+00+0.5000000000E+00
CURVE 2	MIN. FREQ.	325.3674300E+00+0.9101000000E+00
CURVE 3	MAX. FREQ.	3094.70971E+00+0.0000000000E+00
CURVE 4	MIN. FREQ.	317.304600E+00+0.0000000000E+00
CURVE 5	AVG.	313.25144E+00+0.0000000000E+00

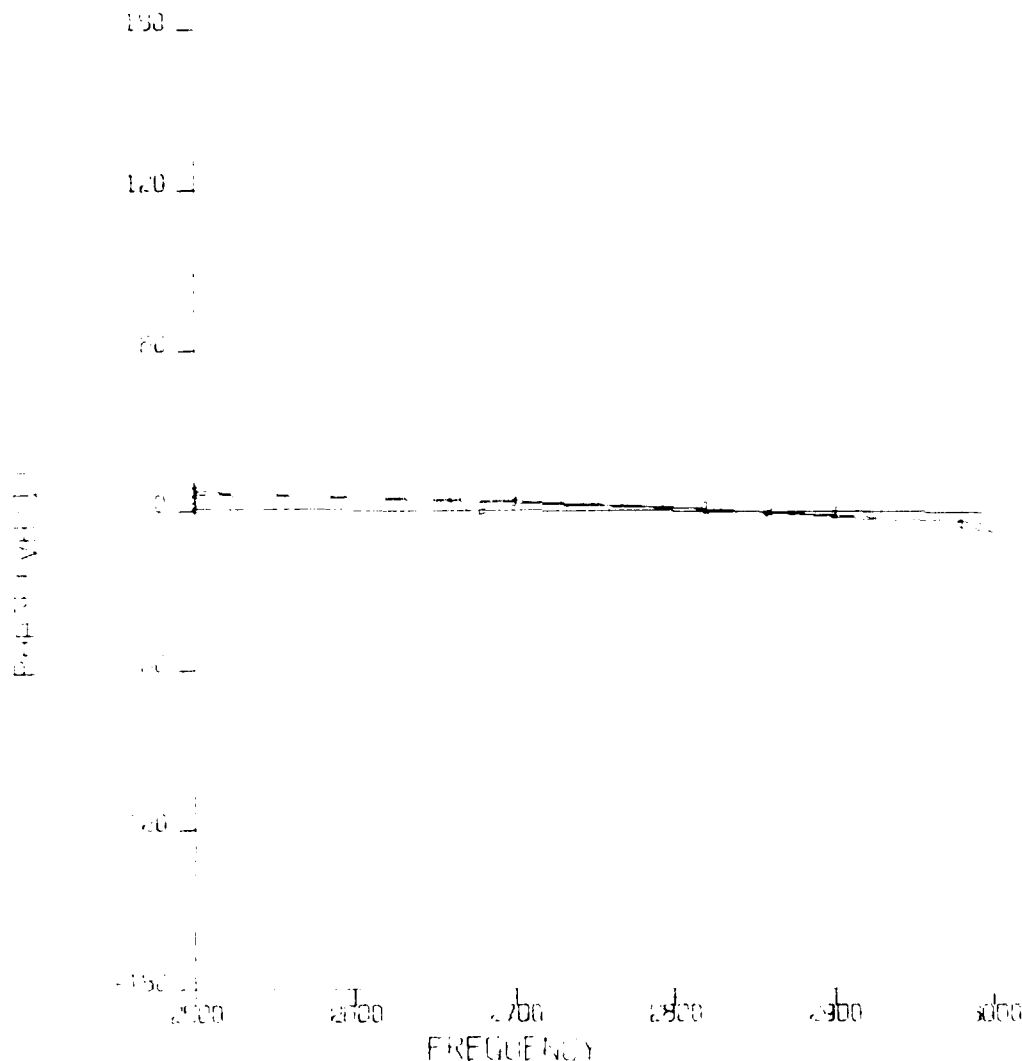
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=13295 OP=1450 CS=2094E-7 DS=0



MAG. VOLT. VERSUS FREQUENCY

CURVE 1	MAX. RES	$1.3322745E-05 + j 2.3019171E-05$
CURVE 2	MAX. R	$7.114807448E-05 + j 7.9981736E-05$
CURVE 3	MIN. R	$3.78138E-05 + j 1.0912444E-05$
CURVE 4	MIN. X	$8.778134102E-05 + j 1.11053003E-05$
CURVE 5	AVG	$1.9117847123E-05 + j 4.75178473E-05$

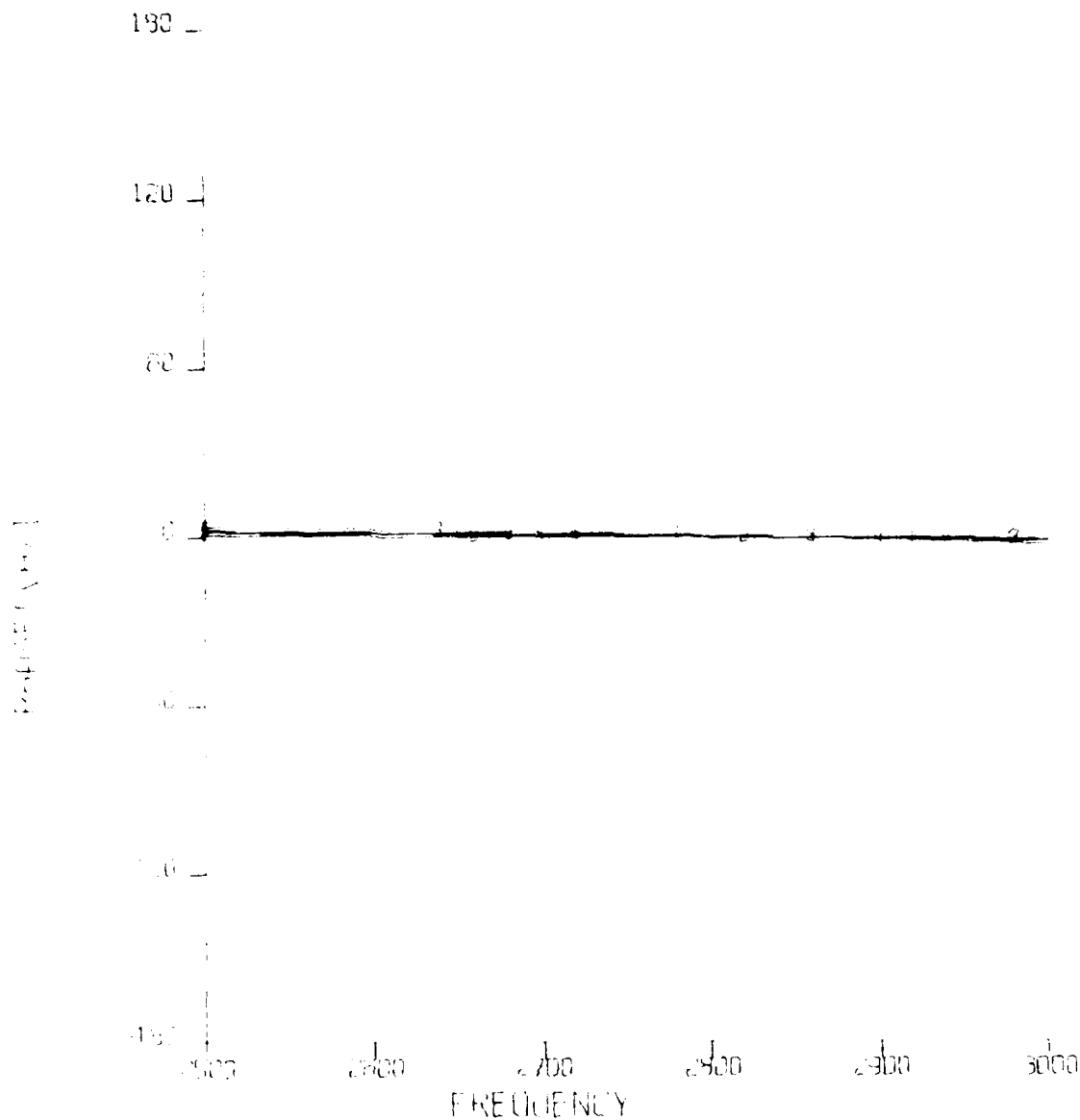
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=3295 OF E+50 CS=2094E-7 DS=0



THESE CURVES VERSUS FREQUENCY

CURVE 1 - MAX RES 4.05870781E-04 CS=48305876E-06
 CURVE 2 - MIN R 3.50118317E-05 CS=28735198E-05
 CURVE 3 - MIN 3.09405382E-04 CS=25781931E-04

FINAL DESIGN OF ITERATION 1
 C.F. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE TO .301
 LP=3295 OFEE+50 CS=42094E-7 DS=0



PHASE CURVE 11 VERSUS FREQUENCY

CURVE 1	MAX PRES	1.0E+302281E04+05+100880498E05
CURVE 2	MIN X	3.4538244330E05+04+01238198E05
CURVE 3	MAX X	3.46170071E05+04+01238198E04
CURVE 4	MIN X	3.73844098E05+04+01307533E05
CURVE 5	AVG	3.38953447E05+04+0130907108E05

FINAL DESIGN OF ITERATION 1
 C.F. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)

LF=1.3295 OF=1E+50 OS=1.2094E-7 DS=0

190 —

120 —

80 —

0 —

—

—

Plot of Γ_{max} vs

190 —

120 —

80 —

0 —

—

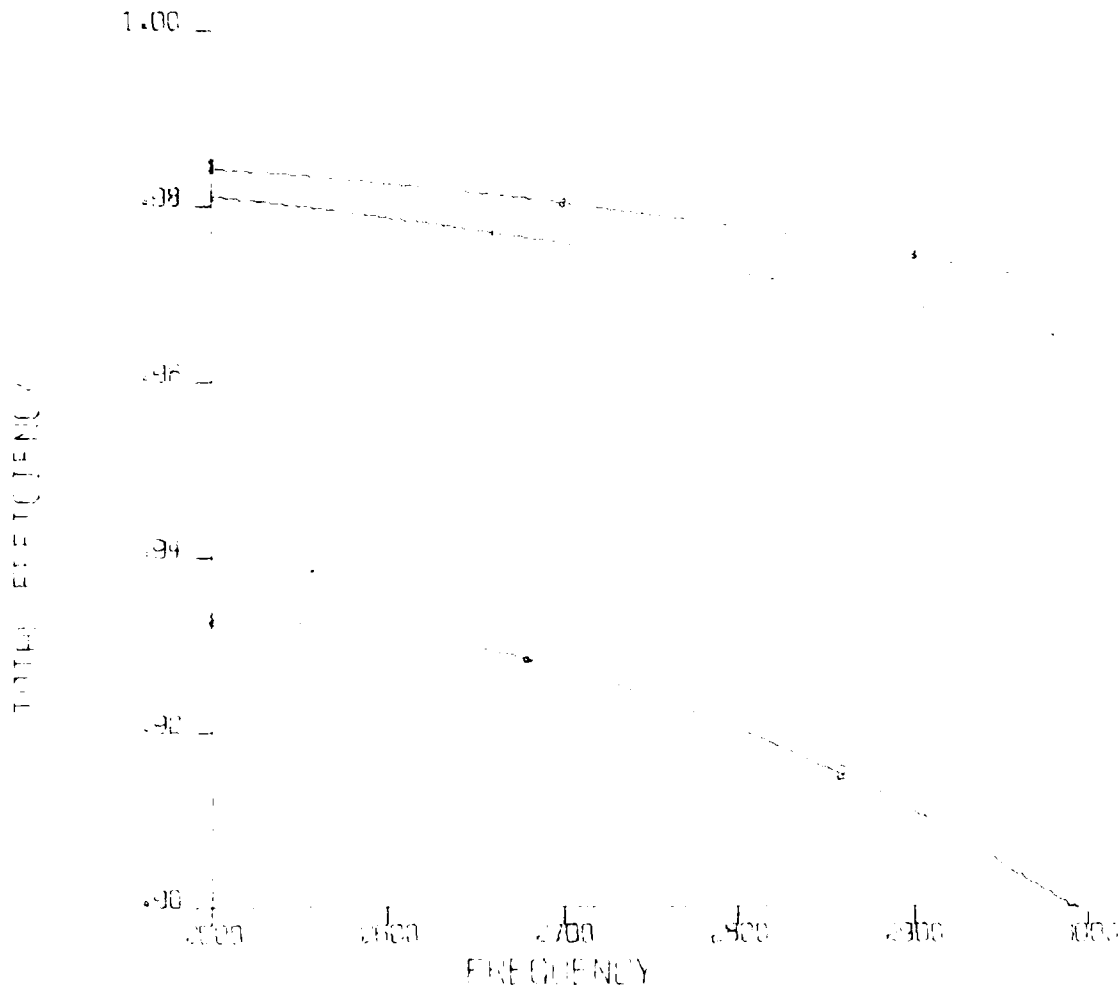
—

FREQUENCY

PERCENTAGE LOSS VERSUS FREQUENCY

CURVE 1	MAX LOSS	1.3295E+50	1.3295E+50
CURVE 2	MAX LOSS	1.3295E+50	1.3295E+50
CURVE 3	MIN LOSS	1.3295E+50	1.3295E+50
CURVE 4	MIN LOSS	1.3295E+50	1.3295E+50
CURVE 5	MIN LOSS	1.3295E+50	1.3295E+50

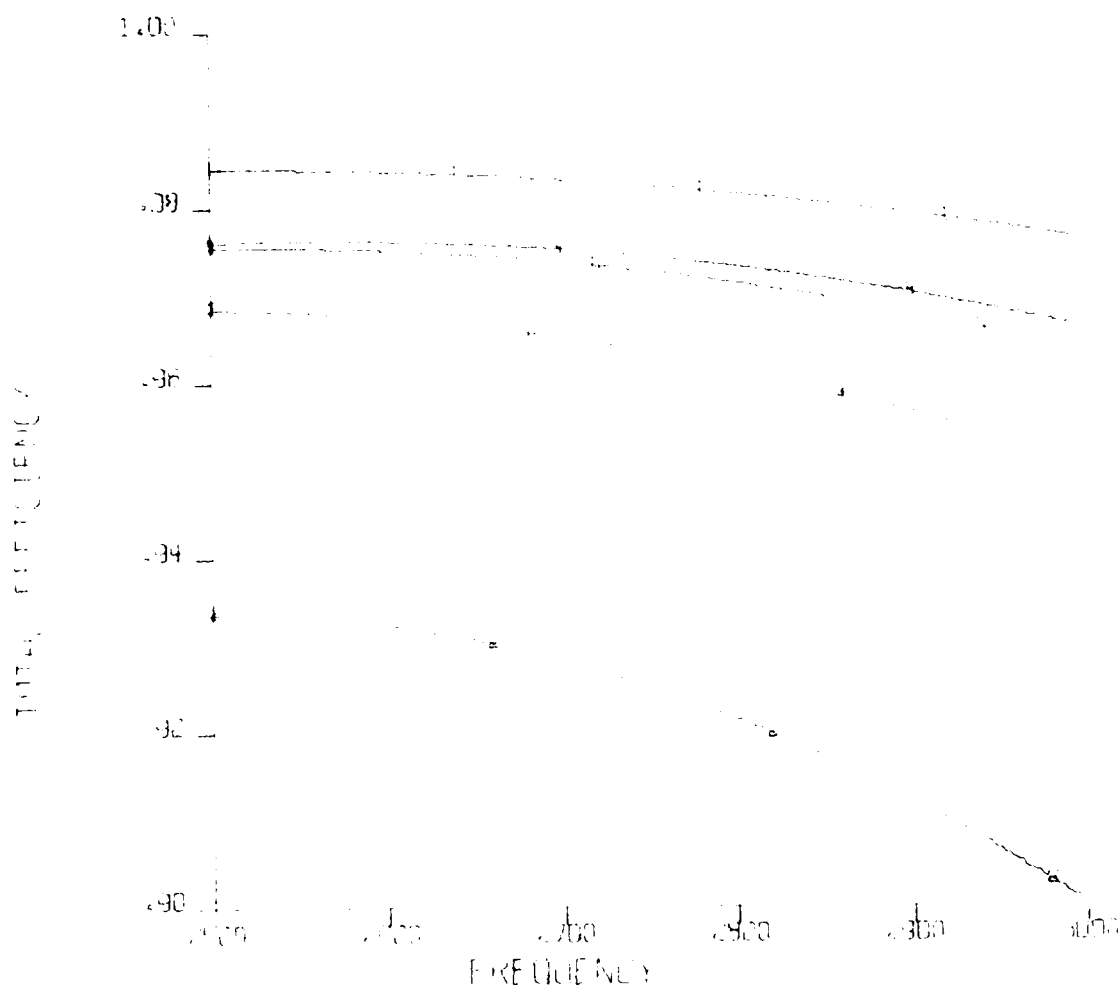
FINAL DESIGN OF ITERATION 1
 C.D. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LFL 3295 OFE +50 CS 2094E-7 DS=0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 MAX EFF 9.013370E-01 (0.901337) AT 2.000E+00
 CURVE 2 MIN W 3.100184E-01 (0.310184) AT 2.000E+00
 CURVE 3 MAX 3.100184E-01 (0.310184) AT 2.000E+00

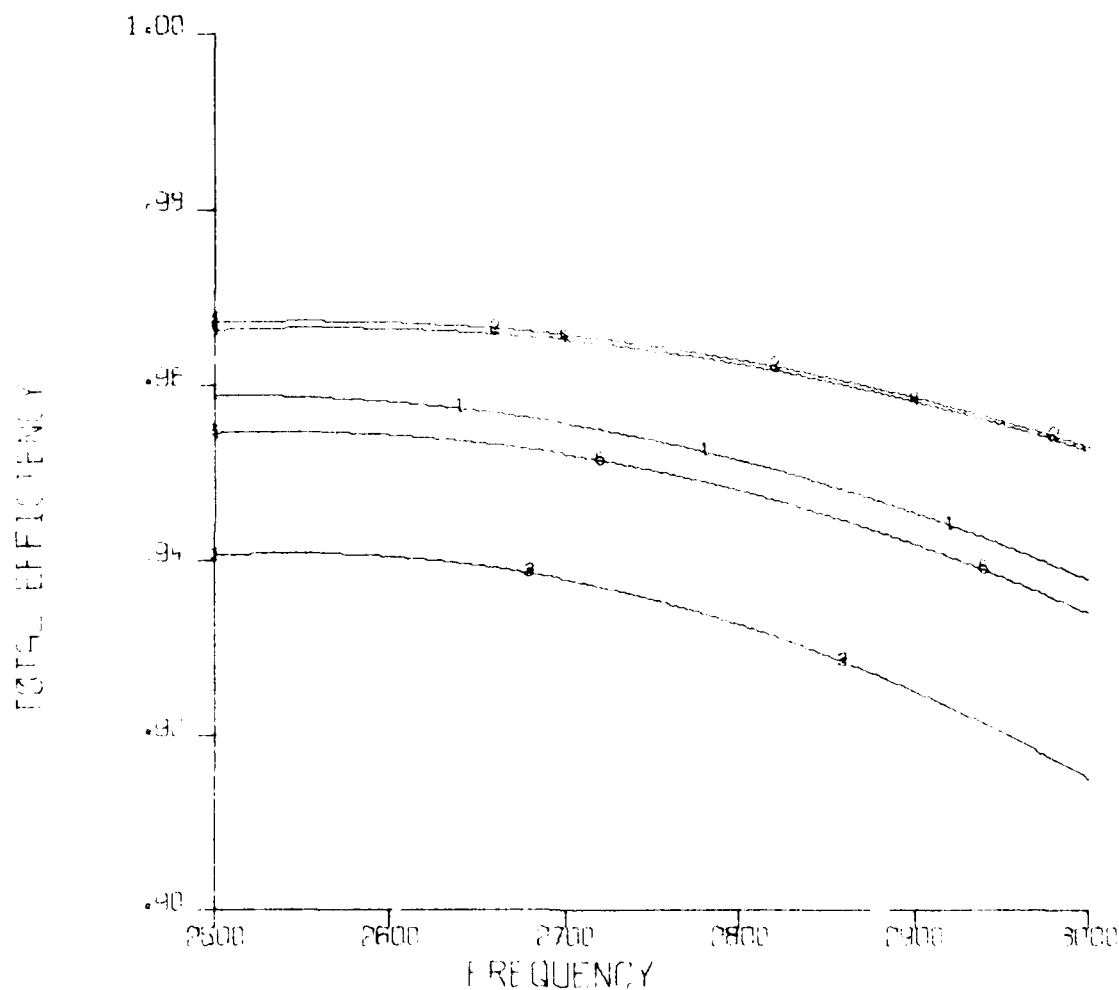
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE TO 300
 LPA 3295 OF E+50 CS 2094E 7 DS-0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1	MAX. EFF.	1.00302281E-04+ 13.1005M+ 49E-05
CURVE 2	MAX. X	3.77397453E-05+ 8.1112383998E-05
CURVE 3	MAX. X	3.56170411E-05+ 7.10612498104
CURVE 4	MAX. X	3.77397453E-05+ 12.13075338E-05
CURVE 5	MAX. X	3.81544478E-05+ 13.9001241E-05

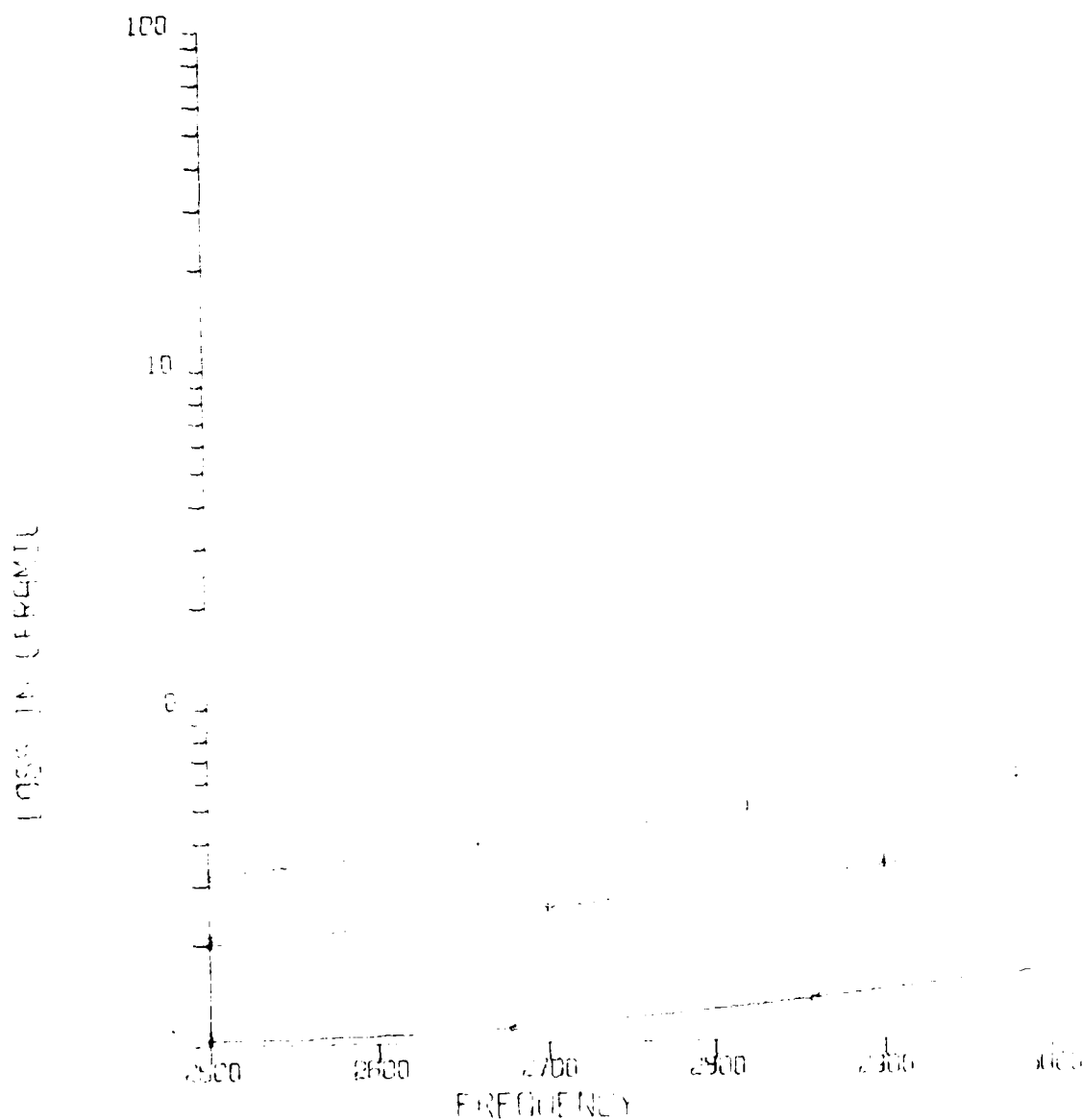
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3295 QP=E+50 CS=.2094E-7 DS=0



TOTAL EFFICIENCY VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.8326748E03+J8.17301416E03
 CURVE 2 - MAX R =7.04807449E03+J0.70480736E03
 CURVE 3 - MIN R =3.78636591E03+J3.64503485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857173E03+J4.58678478E03

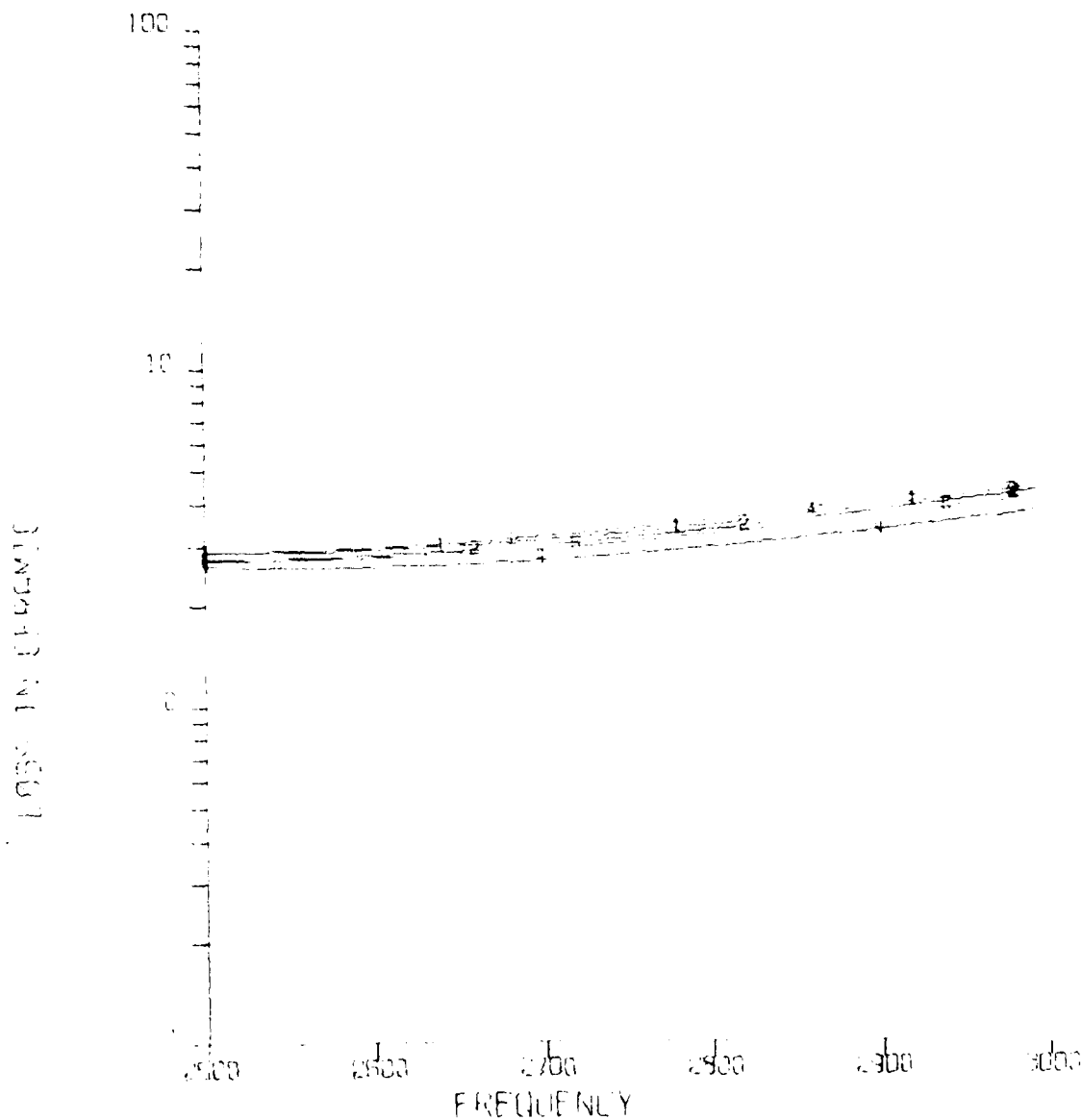
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)
 LP=.3295 OP=E+50 CS=.2094E-7 DS=0



LOSS IN DB-MIL VERSUS FREQUENCY

CURVE 1 MAX LOSS 4.03370761E 04 + 5.43303875E 04
 CURVE 2 MIN R 3.50073917E 03 + 3.28135198E 03
 CURVE 3 AVG 3.0404302E 04 + 3.28135198E 04

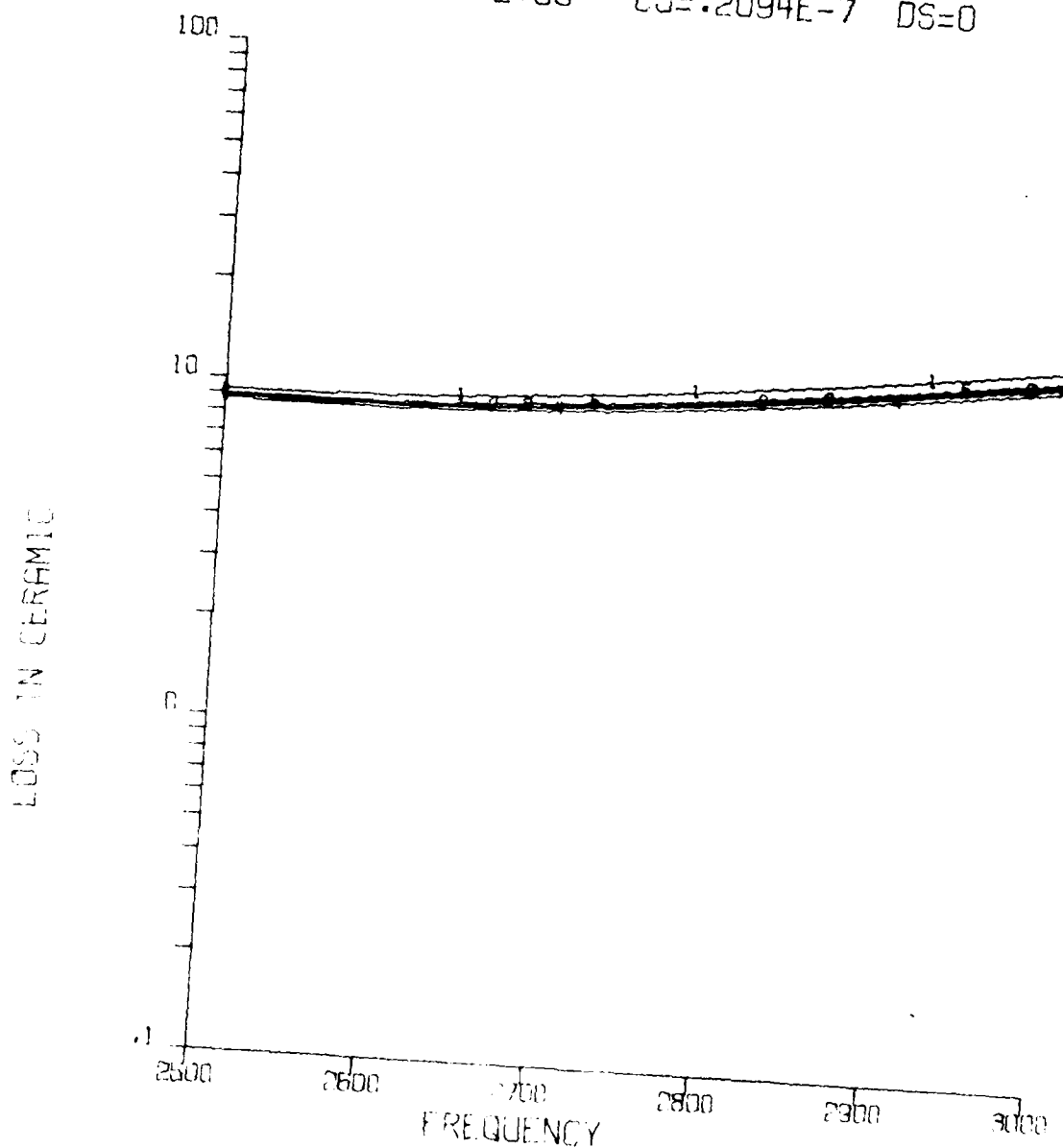
FINAL DESIGN OF ITERATION 1
 C.F. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 L.F. 3295 QP+E+50 CS= 2094E-7 DS=0



LOSS IN DBM VERSUS FREQUENCY

CURVE 1	MAX PRES	$1.48E+02281E04 + 1.0088045E03$
CURVE 2	MIN R	$-3.33874890E03 + 1.01188190E03$
CURVE 3	MAX X	$3.44770071E03 + 1.00017601E04$
CURVE 4	MIN X	$3.73845096E03 + 1.01307573E03$
CURVE 5	AVG	$3.8353407E03 + 1.03204507E03$

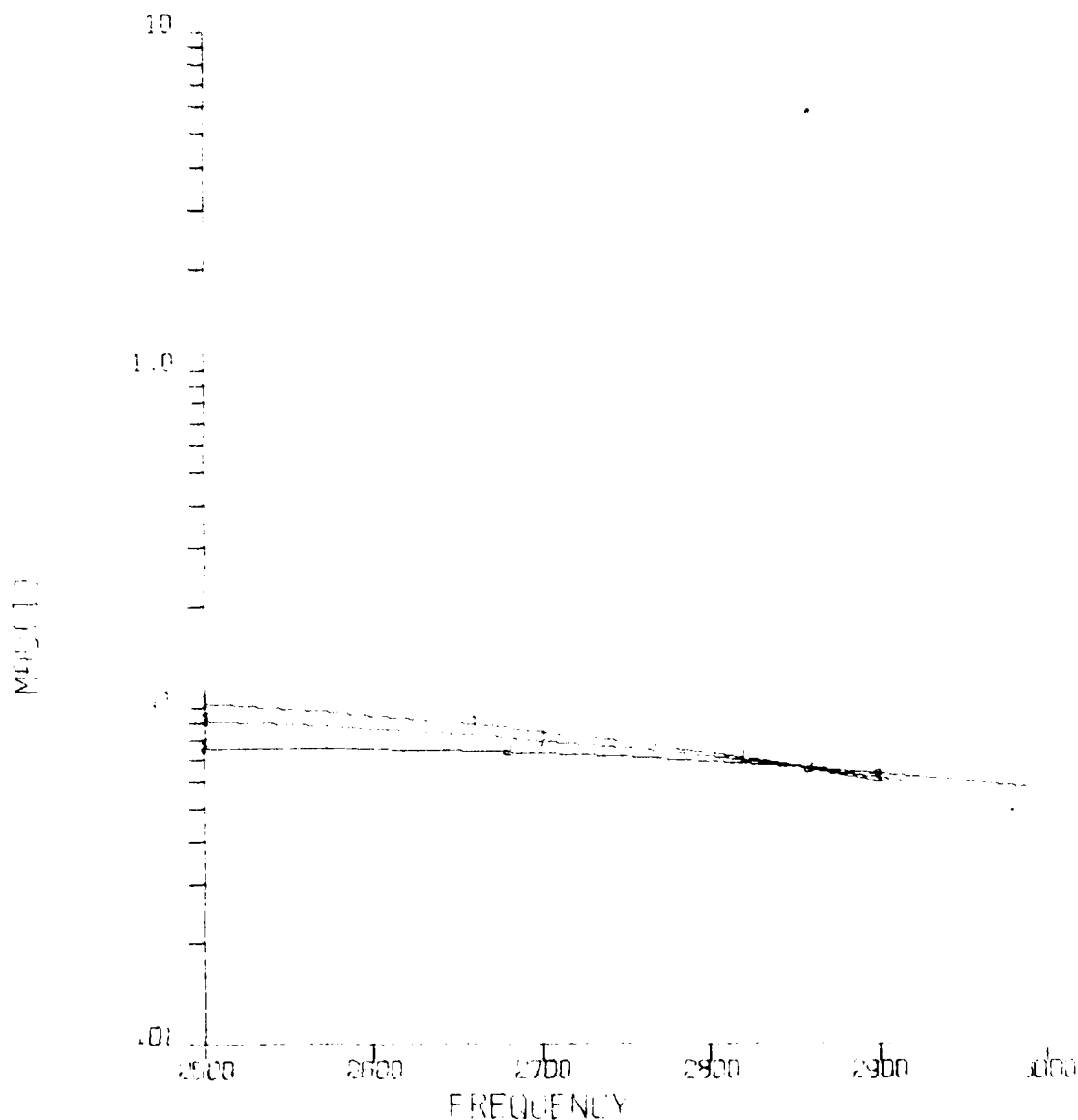
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3295 QP=E+50 CS=.2094E-7 DS=0



LOSS IN CERAMIC VERSUS FREQUENCY

CURVE 1 - MAX PRES = $5.83276748E03 + J8.12301916E03$
 CURVE 2 - MAX R = $7.04807448E03 + J2.79985746E03$
 CURVE 3 - MIN R = $3.78636541E03 + J3.64525485E03$
 CURVE 4 - MIN X = $6.77634102E03 + J1.41083003E03$
 CURVE 5 - AVG = $5.07857123E03 + J4.58679128E03$

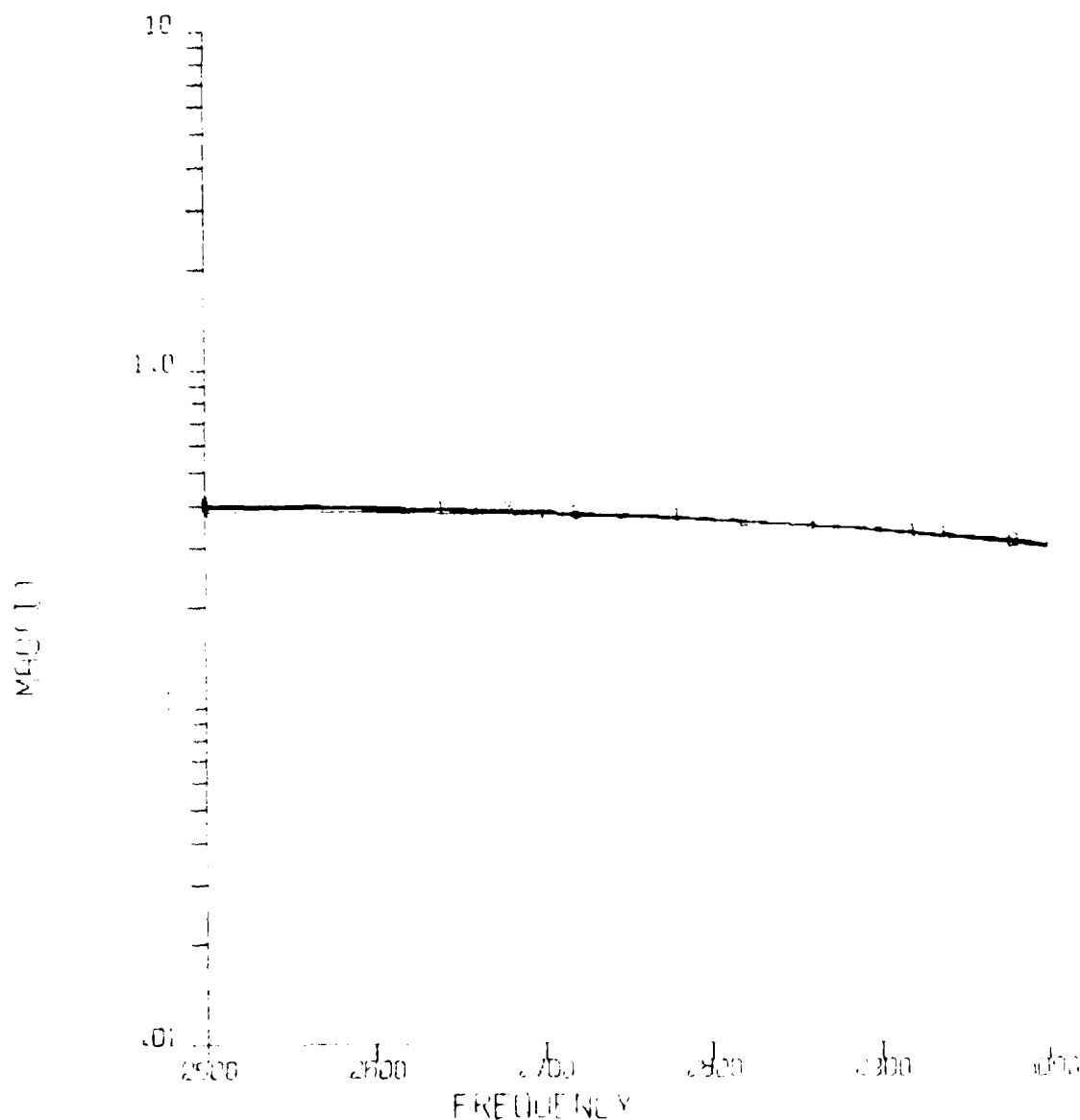
FINAL DESIGN OF ITERATION 1
 C.F. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0,0)
 LP=-.3295 OP=E+50 CS=-2094E-7 DS=0



MAG(1) VERSUS FREQUENCY

CURVE 1	MAX PRES	4.106370761E04	+78.48301375E04
CURVE 2	MIN R	-3.50168912E03	+9.2873598E03
CURVE 3	AVG	-3.09009392E04	+9.12578103E04

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.3295 QP=E+50 CS= 2094E-7 DS=0

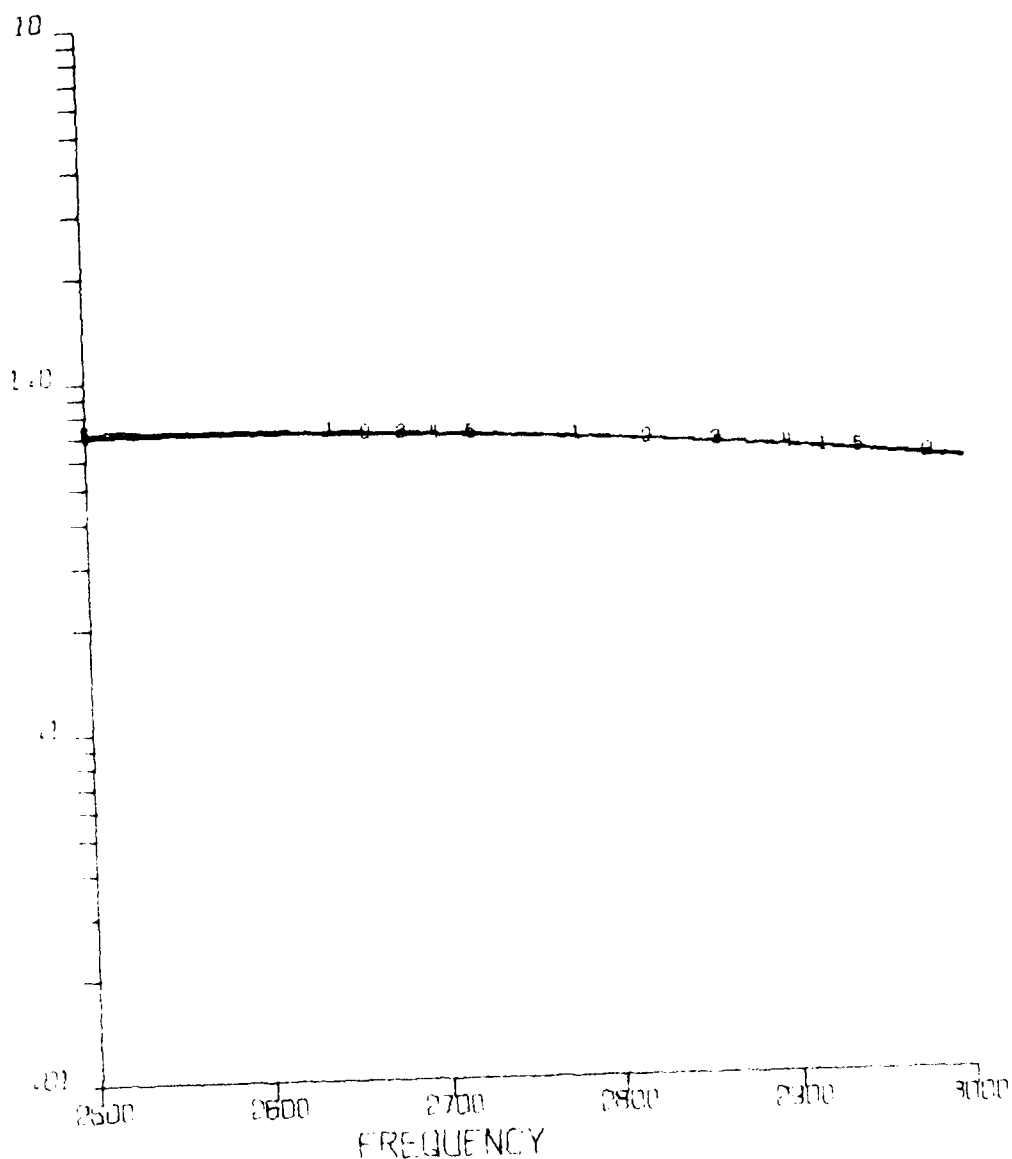


MAG. 1 VERSUS FREQUENCY

CURVE 1	MAX. PNE	1.41 30.23710E+00 1.00000E+00
CURVE 2	MIN. R	3.53324880E+00 1.00000E+00
CURVE 3	MAX. X	3.44170071E+00 1.00000E+00
CURVE 4	MIN. X	3.73840448E+00 1.00000E+00
CURVE 5	QVG	3.38504071E+00 1.00000E+00

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3295 QP=E+50 CS=.2094E-7 DS=0

MAG(1)

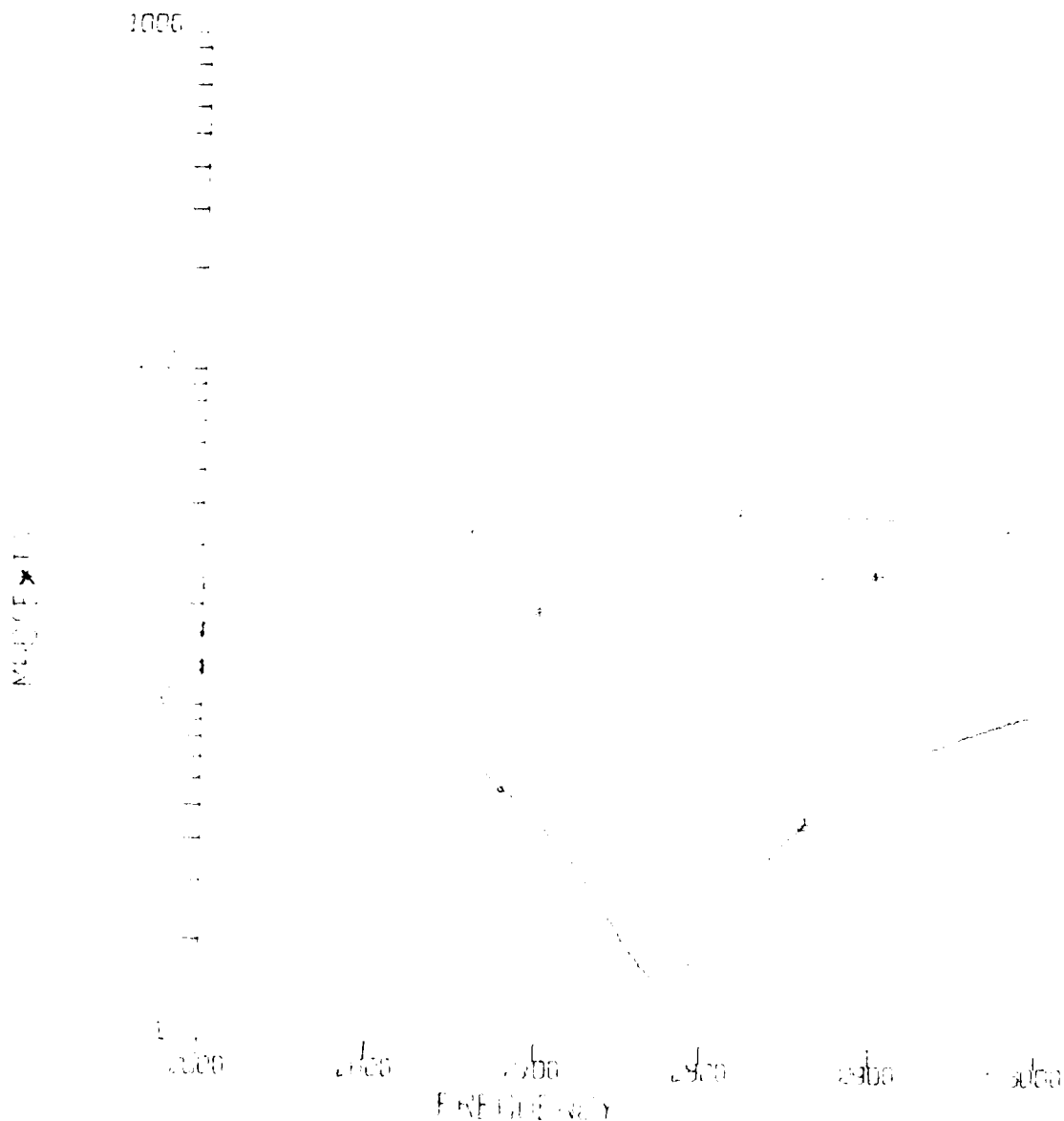


MAG(1) VERSUS FREQUENCY

CURVE 1	- MAX PRES	= 5.83276748E03 + J8.12301116E03
CURVE 2	- MAX R	= 7.04807449E03 + J0.74495716E03
CURVE 3	- MIN R	= 3.78636591E03 + J3.64525485E03
CURVE 4	- MIN X	= 6.77634107E03 + J1.41093003E03
CURVE 5	- AVG	= 5.07857123E03 + J4.58678478E03

FINAL DESIGN OF ITERATION 1
 CAP. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND ENDFIRE (0.0)

LP 3295 OP-F450 OS 2094E 7 DS=0



PROJECT * 1 - REASON FOR FREQUENCY

CURVE 1 MAX FREQ = 6.33707E+04 6.33707E+04
 CURVE 2 MIN FREQ = 3.14159E+03 3.14159E+03
 CURVE 3 MAX FREQ = 3.14159E+03 3.14159E+03

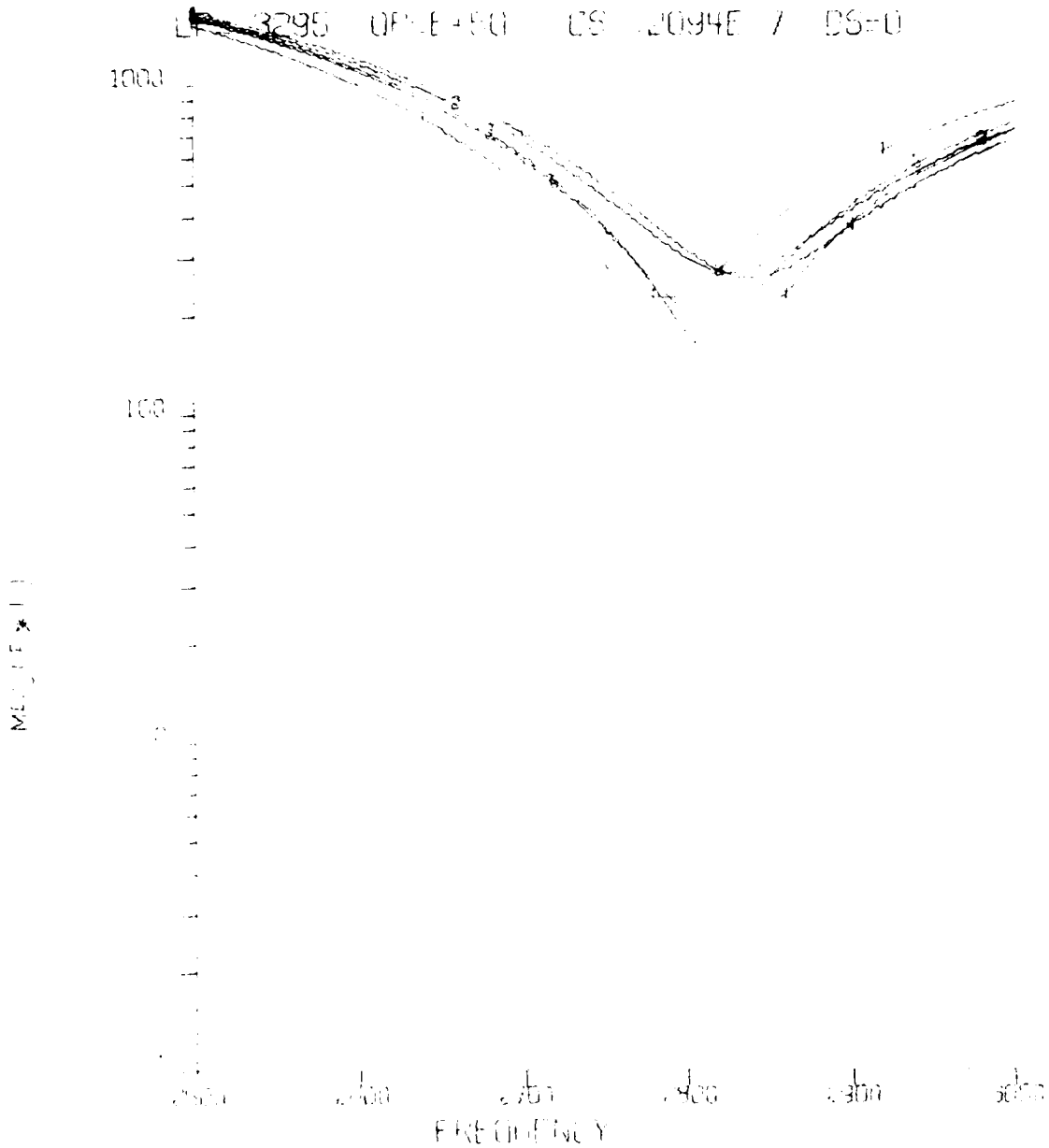
FINAL DESIGN OF INTERLOCK
COP. 1.1 - 1.2 WITH CORRECTIONS
HIGH BOND 30 DEGREE TO 30
LH 3205 OF 1.1 - 1.2 1994 / 2000

[illegible]

FINAL DESIGN OF ITERATION 1
C.P. 1.1 5 INCH CIRCULAR HEAD

HIGH BAND BROUDEST 10,900

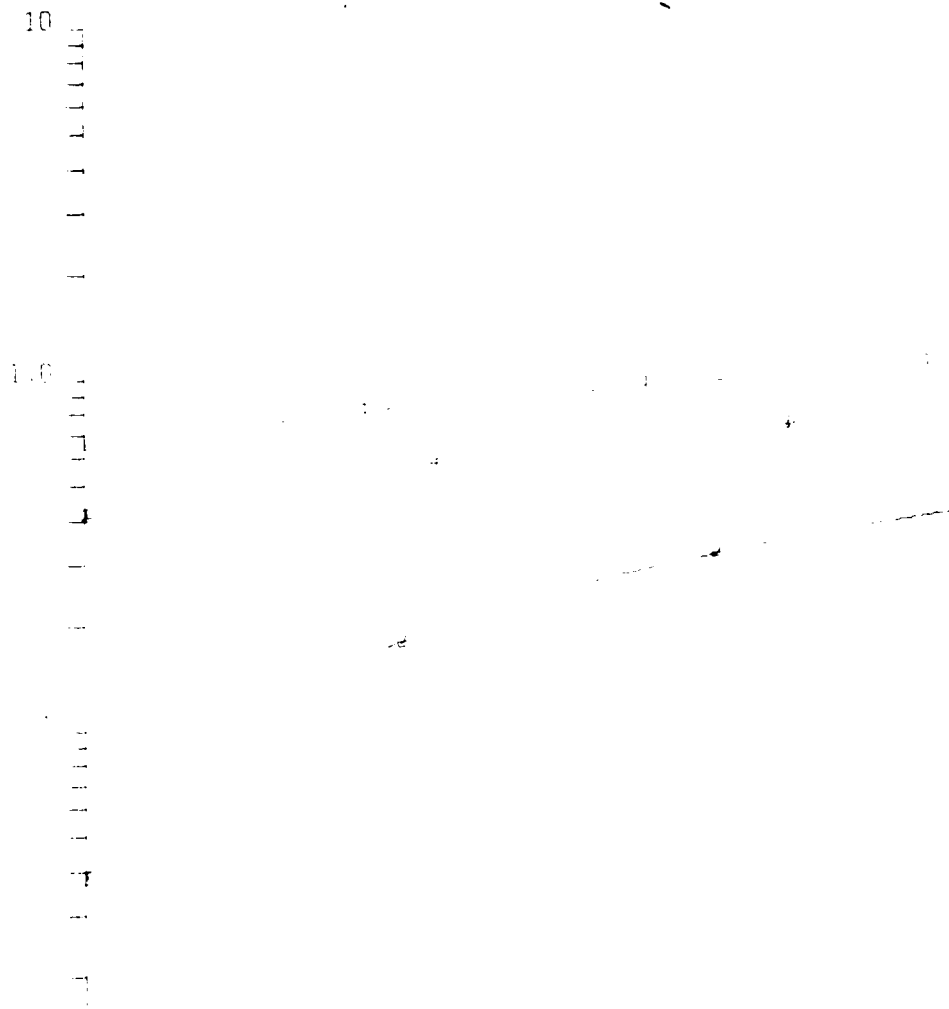
3295 OFLE-450 CS 2094E 7 DS=0

[illegible]

Run	Time	Temp	Pressure	Flow Rate	Flow Rate
Run 1	10:00	100.0	10.0	10.0	10.0
Run 2	10:05	100.0	10.0	10.0	10.0
Run 3	10:10	100.0	10.0	10.0	10.0
Run 4	10:15	100.0	10.0	10.0	10.0
Run 5	10:20	100.0	10.0	10.0	10.0

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BANL ENDFIRE 10.0)
 LP=13295 OP=1E+50 CS=12094E-7 DS=0

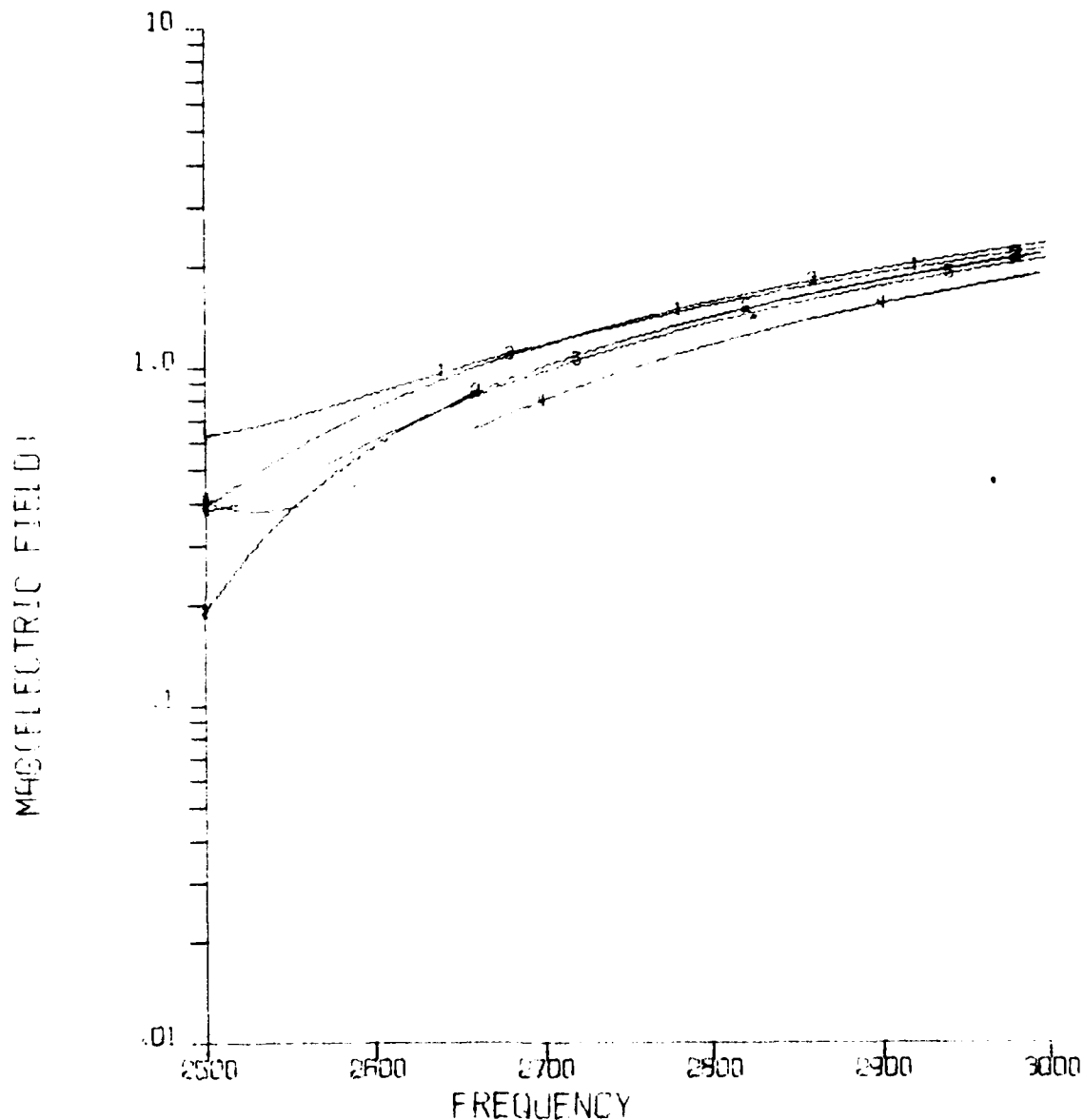
Iteration 1



1000 2000 3000 4000
 FREQUENCY

1000 2000 3000 4000
 FREQUENCY

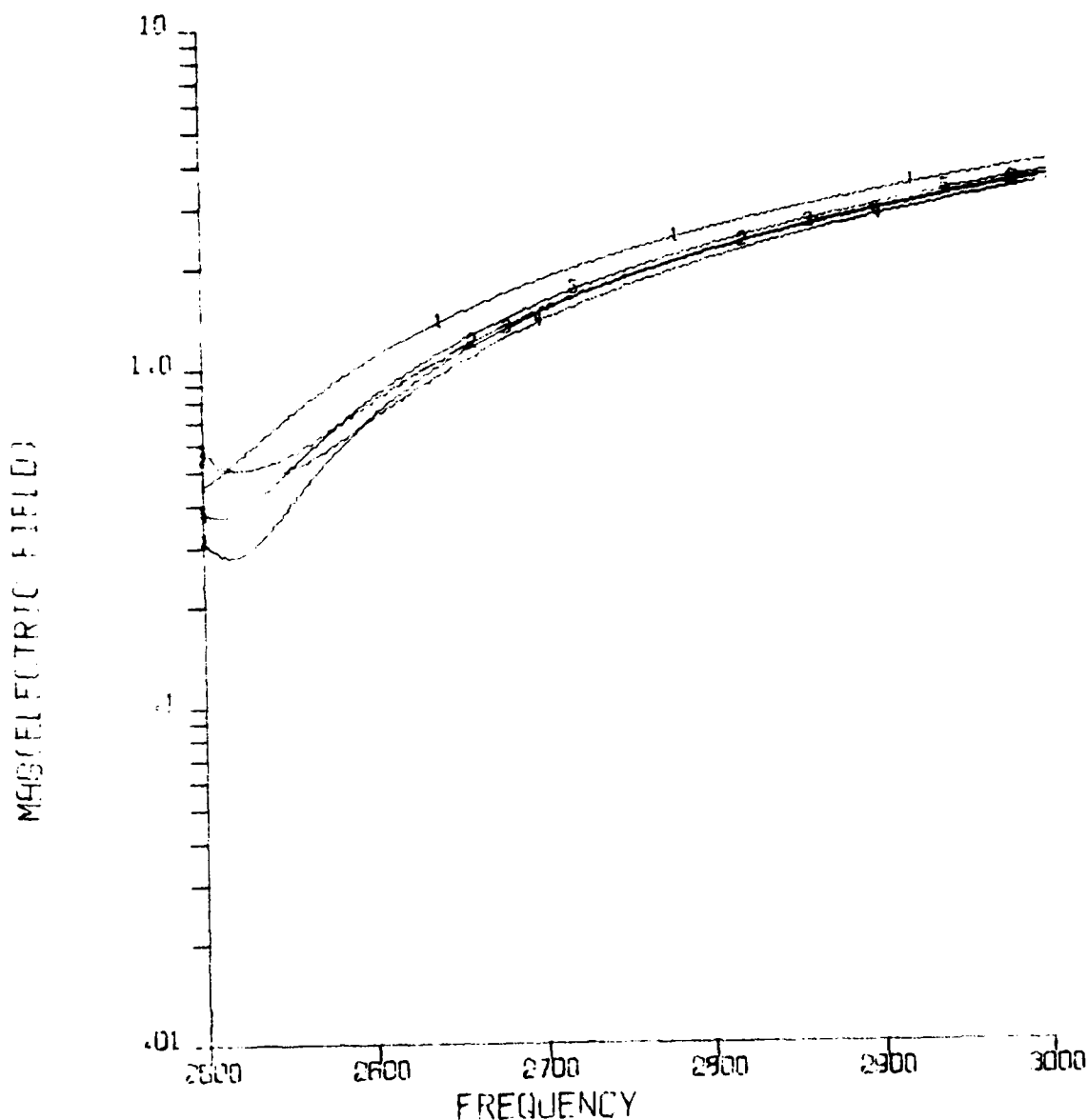
FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND 30 DEGREE (0.30)
 LP=.3295 OP=E+50 CS=.2094E-7 DS=0



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1	MAX PRES	=1.65302281E04+J8.10088048E03
CURVE 2	MIN R	=3.53874880E03+J9.01288799E03
CURVE 3	MAX X	=8.44770071E03+J1.20617606E04
CURVE 4	MIN X	=9.73845096E03+J1.52307533E03
CURVE 5	AVG	=3.89594457E03+J6.38905826E03

FINAL DESIGN OF ITERATION 1
 C.P. 1.1 5 INCH CIRCULAR HEAD
 HIGH BAND BROADSIDE (0.90)
 LP=.3295 QP=E+50 CS=.2094E-7 DS=0



MAGNETIC FIELD VERSUS FREQUENCY

CURVE 1 - MAX PRES=5.83226748E03+J8.12301916E03
 CURVE 2 - MAX R =7.04807449E03+J2.79985796E03
 CURVE 3 - MIN R =3.78636591E03+J3.64525485E03
 CURVE 4 - MIN X =6.77634102E03+J1.41083003E03
 CURVE 5 - AVG =5.07857123E03+J4.58678978E03